GAS

SEPTEMBER 1959

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CONTENTS

SEPTEMBER 1959

35TH YEAR OF PUBLICATION VOLUME THIRTY-FIVE • NUMBER 9

FEATURES

Design and installation of standardized regulator vaults... 59
By William T. Harper

Developing and installing a construction analysis program.. 62
By John L. McCollum

A guide to training servicemen: 5. Gas incinerators—and people 67
By Robert W. Bell

Operating the small but growing utility..... 70
By Lee E. Schlessman and Homer S. Lanning

Regional pipeline planning 78

Welders go back to school..... 82

Hydraulic crane and 5-wheel truck cut operating costs..... 86

PIPELINE SECTION

Measuring wet high pressure gas 117
By Clyde C. Copper

New gas processing plant boosts western Canada's economy 119
By George E. Toles

Economics in pipeline engineering 123
By Frank V. Whitney

Operation Stopple 131

DEPARTMENTS

Editorial Comment—

Thermally Thinking, *by J. Fred Ebdon* 6
Highlights 8
Regulatory and Legislative Trends 11
Technical Trends, *by Guy Corfield* 15
Washington, *by Neil Regeimbal* ... 17
Corrosion Prevention, *by Marshall Parker* .. 19
Communications, *by Frank Chapman* .. 140

News Developments—

Lower rates for air conditioning users 88
13-year wait ending for NI-Gas customers ... 90
Transwestern gets commission approval 148
Price-conscious FPC okays Northern plan.. 148

Departments—

Digest of New Products and Trade Literature. 94
Associations 103
People 106
Calendar 113
Pipeline People 164
Advertisers Index 168

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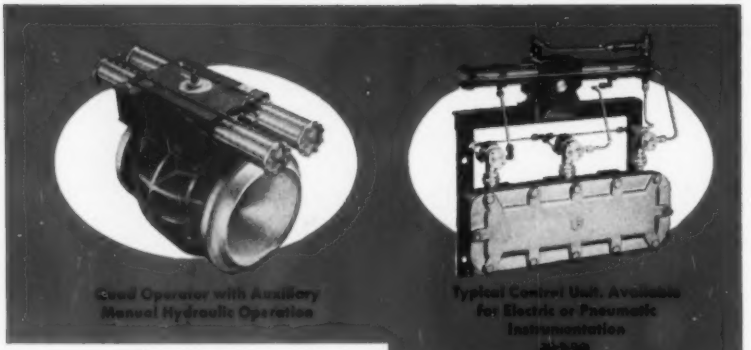

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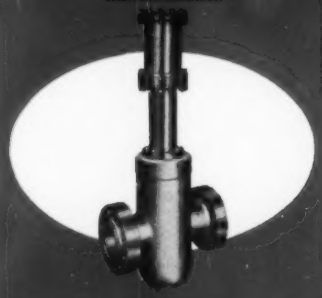

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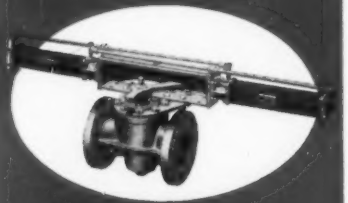

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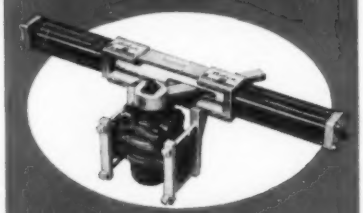

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Thermally Thinking

ENERGY consumption in these United States has increased rapidly during the last 50 years. About the only thing that has kept pace is the national debt.

Energy consumption and standard of living go together like red beans and rice or, for any New Englanders who might wander over this page, like codfish cakes and chowder. Plenty of available energy means a high standard of living. Any country caught with energy supply down, consequently suffers in its standard of living.

A plot of energy consumption per person is followed with vigorous fidelity by curves of gross national product and income per person. Since gross national product and personal income are synonymous with standard of living, unless you have a lot of lazy louts and misers on your hands, we have validated our concept that energy is the key to a high standard of living.

Natural gas currently supplies about 25 per cent of the total energy to the United States. Reliable experts expect gas demand to increase by about 4 per cent per year (that is demand, not per cent of total energy used).

The gas industry should take a careful look at a couple (at least) matters that are vital to its capability for increasing supply to meet future demand. As is often the case, our government is holding the critical cards. The teaser is: Which way are the tickets going to flop?

Examiner Zwerdling's decision in the "Phillips Producer" case was one of these matters. Therein, Federal tax benefits from statutory depletion and tax write-off of intangible drilling costs (in the year incurred) were seemingly passed on to consumers. It may be that Examiner Zwerdling wanted to offset this a bit when he recommended a 9.25 per cent rate of return to the producer, Phillips, even though a lot of interested parties thought something like 7.75 per cent return would do the job. Phillips still thinks 12 per cent would be more realistic.

Mr. Paul Kayser — a man who certainly knows where energy comes from and where it goes—recently had these words to say on the subject: "In my judgment, if the producer is deprived of tax advantages given to him by Congress in percentage depletion and writeoff of intangibles, there will be little or no exploration on the part of anyone for gas alone. If that is true, in my judgment, it is highly questionable whether 10 years from now there will be added to new proven reserves 17 trillion cu ft, the estimated production required to meet estimated 1968 demand, based upon the present trend of increase in the demand for gas. If that should occur, then it is obvious that gas cannot maintain its position supplying 25 per cent of our energy requirements and such requirements must necessarily be supplied from some other source of energy or else the economy will shrink to that extent."

Tongue-and-grooving with this idea that you have to explore for natural gas and find some before you sell, is the situation of oil imports.

You can produce crude in a foreign land and ship it around the world three or four times and still bring it into the U. S. at a lower cost per barrel than domestic crude. (I have slightly overstated the distance shipped, for emphasis.) The same principle applies generally to refined products. Hence, interest has been stimulated in foreign exploration at a loss to domestic exploration. And when oil companies bring in foreign crudes, most of the commingled and coproduced natural gas stays overseas.

Thus, I conclude that as much as we detest government control, mandatory regulation of oil imports seems to be needed. If the U. S. is flooded with foreign crude and products, our defense position is dented and domestic exploration suffers.

In summary, if future energy requirements for natural gas and oil are to be met, a lot of exploration will have to be done. It behooves the gas industry to consider as absolutely necessary: (1) mandatory control of oil imports and (2) some formula from FPC for building field gas prices on a foundation that will assure discovery of latent reserves to meet future demands.

J. Fred Ebsan

EDITOR

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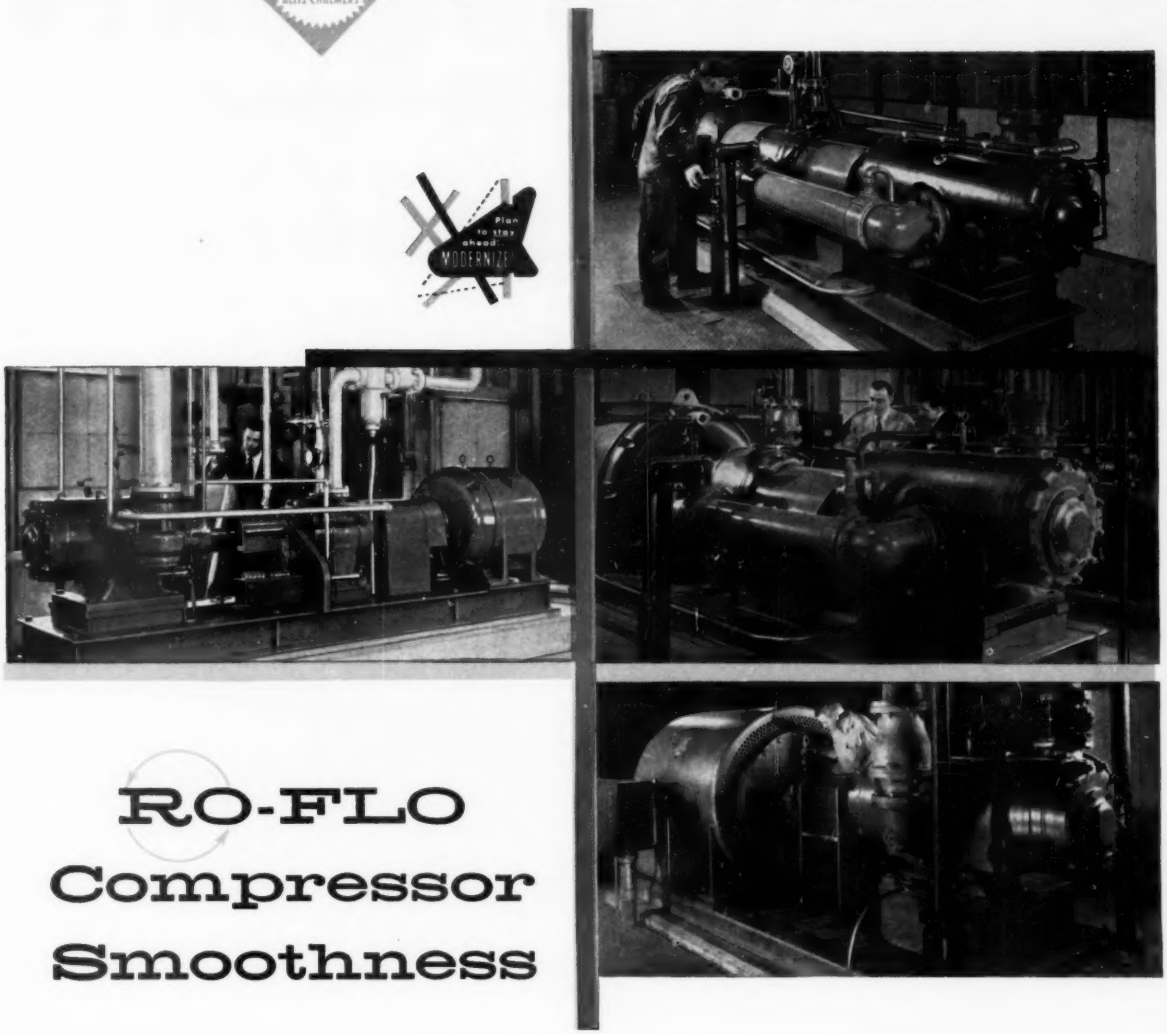

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GAS HIGHLIGHTS

Transwestern gets FPC certificate

Transwestern Pipeline Co. has a certificate to build a Texas-to-California pipeline. FPC conditioned the certificate on generally lower rates for the gas, which will be sold to Pacific Lighting Gas Supply Co. FPC also issued certificates to 14 independent producers and a pipeline company to supply the 308 MMcf per day which Transwestern will deliver. These, too, were conditioned with generally lower initial rates than were sought. These rate conditions probably will cause most of the companies and producers involved to petition for a re-hearing before the commissioners. (For more details, see page 150.)

Phillips objects to Zwerdling decision

Phillips Petroleum Co. has filed 134 specific exceptions to Examiner Zwerdling's decision in its long-standing field price case. Main points in the Phillips exceptions deal with Zwerdling's rulings concerning depletion allowances and intangible drilling costs. Phillips contends it should be allowed the full benefits of Federal tax benefits from statutory depletion and expensing of well drilling costs in determining its costs. The examiner ruled these tax benefits should be considered in determining the costs. The producer also seeks a return of 12 per cent, against the 9.25 per cent rate recommended by the examiner.

Other companies object, too

Pipelines and distributors from all parts of the U. S. also have filed exceptions to the Phillips decision. Three pipelines—Northern Natural, Panhandle Eastern and Michigan-Wisconsin — object to system-wide field pricing, as recommended by Zwerdling. El Paso Natural filed an objection dealing mainly with the validity of spiral escalation clauses.

Northern finally wins expansion fight

Northern Natural Gas Co. has won its long-pending bid to serve the Duluth-Superior area of Minnesota. FPC has certificated Northern and Iron Ranges Natural Gas Co. to build $122.2 million worth of facilities. Northern will add 342 towns in six states. Iron Ranges, which will be supplied by the pipeline, will serve 38 more. (See page 150 for more details.)

PUC finds Richfield a public utility

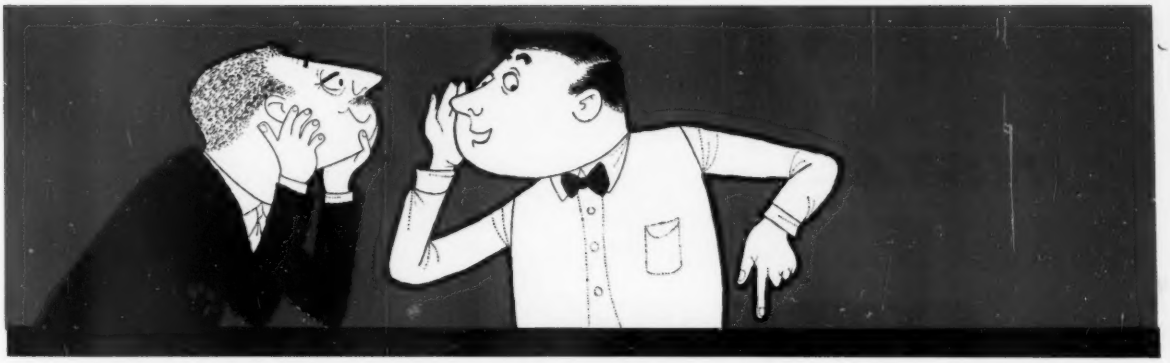
California's PUC has ruled that Richfield Oil Corp.'s intrastate pipeline, supplying gas to a Southern California Edison Co. generating plant, makes Richfield a public utility gas company, and places it under PUC jurisdiction. While the commission did not order the line shut down, as had been sought by Southern Counties Gas Co., it did order Richfield to file within seven months a tariff for public utility gas service. Just how the PUC decision that Richfield is a public utility will affect that company's gas production operations is not yet known. Hearings on whether or not the completed and operating line should be certificated will start Sept. 25 in Los Angeles.

Muni gas systems still are growing

The number of municipally owned gas utilities in the U. S. has increased by 57—11.2 per cent—over last year, AGA reports. As of July 1, 566 city-owned gas systems were in operation, serving more than 2.1 million customers. Municipal systems are operating in 34 states. Increases in government-supported operations were reported in 13 states, declines in two. Twenty-five new municipal systems sprung up during the past 12 months in Alabama and Tennessee.

Texas Illinois wants to expand its system

Texas Illinois Natural Gas Pipeline Co. is seeking FPC approval to expand its system to deliver an additional 85 MMcf/day to customers in seven states. The Peoples Gas Light & Coke Co. subsidiary wants to build 371 miles of 30-in. line, paralleling an existing line, and add a new compressor station. Cost of the project is estimated at $43.5 million.



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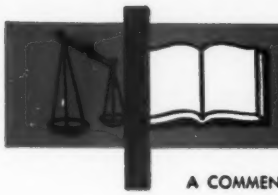


Regulatory and Legislative Trends

A COMMENTARY ON NATIONAL AND STATE DEVELOPMENTS BY AN EXPERT IN UTILITY LAW

CATCO, celebrated case

THE United States Supreme Court recently decided the CATCO case with far-reaching declarations. The Court declared that the purpose of the Natural Gas Act was to underwrite reasonable rates and adequate service to consumers. The highest court also announced that the Federal Power Commission has authority to place initial price conditions on certificates of public convenience and necessity. In this celebrated case, the Supreme Court declared: "Where the proposed price is not in keeping with the public interest because it is out of line or because its approval might result in a triggering of general price rises or an increase in the applicant's existing rates by reason of 'favored nation' clauses or otherwise, the Commission in the exercise of its discretion might attach such conditions as it believes necessary."

The Court sent the case back to the commission for further proceedings, because there was insufficient evidence to support a finding of public convenience and necessity. The proposed price for natural gas was the highest ever paid by the interstate pipeline company. And it was 70 per cent higher than the average cost of gas purchased by the pipeline. No evidence was found to prove that the producers would seek to sell their gas elsewhere than to the pipeline company and the interstate market, if they did not receive the initial contract price of 22.4 cents per Mcf. The 1.75 trillion cu ft of natural gas dedicated to the pipeline in this case prompted the Supreme Court to declare that "Since some 90 per cent of all commercial gas moves into the interstate market, the sale of such vast quantities as available here would hardly be profitable except interstate."

• FPC proceedings

In the same proceeding and on the same evidence FPC had twice refused to issue such an unconditional certificate it finally issued because of "insufficient evidence or testimony . . . on which to base a finding that the public convenience and necessity requires the sale of these volumes of gas at the particular rate level here proposed." On the second occasion it proposed to petitioners that the certificates be conditioned upon an initial price of 18 cents per Mcf (including the 1-cent tax), to be increased to 22.4 cents per Mcf (including the 1-cent tax) after the first 24-hr delivery period, the latter rate to be subjected to the "just and reasonable" provisions of S 4 of the Act. The petitioners refused this proposal, and Tennessee advised the commission that unless the certificates were issued without such conditions, CATCO would not dedicate its gas to the interstate market. Upon rehearing, after argument but without additional evidence, the commission issued the certificates declaring important as is the price, that as far as the public is concerned, the charge that is made initially is less important than the assurance of this great supply of gas for interstate markets.

Certain utilities in New York and New Jersey, as well as the New York Public Service Commission, opposed the issuance of the certificates. They contended that the issuance of the certificates would increase the price of gas to over a million consumers in those two states using the pipeline company's gas.

• Review by court of appeals

There is an automatic review available under the Natural Gas Act if a participant does not like a FPC decision. The Court of Appeals stated that FPC could not conduct such a limited inquiry. It held that "Congress has not given the commission power to inquire into the issue of public convenience and necessity where, as here, the applicant circumscribes the scope of that inquiry by attaching a condition to its application requiring the commission to forego the consideration of an element which may be necessary in the formulation of its judgment."

• The novel gas transaction

The natural gas involved is of a Miocene sand located below seabed out in the Gulf of Mexico 25 miles offshore from Louisiana. Four independent natural gas producers jointly own oil and gas leases (25 per cent to each company) which they obtained from Louisiana covering large acreages of the Continental Shelf off the Louisiana coast. The four companies' joint venture has resulted in the discovery of huge fields of natural gas and they have dedi-

Regulatory trends... The FPC was told to be price concious and to condition certificates where necessary

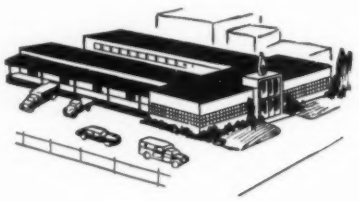
cated 1.75 trillion cu ft of gas from 95,000 acres of their leases to Tennessee Gas Transmission Co., a natural gas company subject to the jurisdiction of the commission.

The contracts call for an initial price of 22.4 cents per Mcf for the gas, including 1-cent tax, with escalation clauses calling for periodic increases in specific amounts. In addition, they provide for Tennessee to receive the gas at platforms on the well sites 25 miles out in the Gulf. This requires it to build approximately 107 miles of pipeline from its nearest existing pipeline point to the offshore platforms at wellhead. The estimated cost was $16,315,412. The necessity for the certificates was based on an application in which Tennessee requested certification to extend its facilities. This program included the building of a pipeline from southeast Louisiana to Portland, Tenn., which would carry a large part of the gas from these leases. Its cost was estimated at $85 million. In addition the contracts provide that Tennessee give free transportation from the wells to the shore of all condensate in the gas for the account of producers who have the option to separate it from the gas at shore stations.

The contracts under which the producers proposed to sell the gas in the interstate market were all conditioned on the issuance of certificates of public convenience and necessity. A failure by either the pipeline or producers to secure such certificates rendered the contracts subject to termination. The filing of the application for a certificate did not constitute a dedication to the interstate market of the gas recoverable under these leases. The producers were at liberty to refuse conditional certificates proposed by the commission's second order. The Supreme Court asserted: "Even though the commission did march up the hill only to march down again upon reaching the summit we cannot say that this about-face deprived it of jurisdiction. We find nothing illegal in the petitioners' rejection of the alternative price proposed by the commission and their standing firm on their own."

• FPC and price considerations

The Act was framed to afford consumers a complete, permanent and effective bond of protection from excessive rates. The heart of the Act is found in those provisions requiring initially that any "proposed service, sale, operation, construction, extension, or acquisition . . . will be required by the present or future public convenience and necessity," and that all rates and charges "made, demanded or received" shall be "just and reasonable." The Act prohibits such movements unless the commission issues a certificate of public con-



venience and necessity. Section 7 (e) vests in the commission control over the conditions under which gas may be initially dedicated to interstate use. Once dedicated there can be no withdrawal of that gas supply from continued interstate movement without commission approval. The gas operator, although to this extent a captive subject to the jurisdiction of the commission, is not without remedy to protect himself. He may, unless otherwise bound by contract, file new rate schedules with the commission. This rate becomes effective upon its filing, subject to the 5-month suspension provision of S 4 and the posting of a bond, where required. This not only gives the natural gas company opportunity to increase its rates where justified but likewise guarantees that the consumer may recover refunds for excessive rate increases. The overriding intent of the Congress to give full protective coverage to the consumer as to price is furtheir emphasized in S 5 of the Act, which authorizes the commission to institute an investigation into existing rates and to fix them at a reasonable level. Under this section, however, the rate found by the commission to be reasonable becomes effective prospectively only. Gas purchasers, therefore, have no protection from excessive charges collected during the pendency of a S 5 proceeding.

The Court stated: "In view of this framework in which the commission is authorized and directed to act, the initial certificating of a proposal under S 7 (e) of the Act as being required by the public convenience and necessity becomes crucial. This is true because the delay incident to determination in S 5 proceedings through which initial certificated rates are reviewable appears nigh interminable."

The Supreme Court admonished FPC to be price-conscious and to condition certificates where it was necessary to protect the public. The Court concluded: "In granting such conditional certificates, the commission does not determine initial prices nor does it overturn those agreed upon by the parties. Rather, it so conditions the certificate that the consuming public may be protected while the justness and reasonableness of the price fixed by the parties is being determined under other sections of the Act. Section 7 procedures in such situations thus act to hold the line awaiting adjudication of a just and reasonable rate." ■

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T-190 DECOR... the freshest touch yet in room thermostats. And this dependable mercury switch thermostat can be color-styled to blend with paint, paper or fabric.

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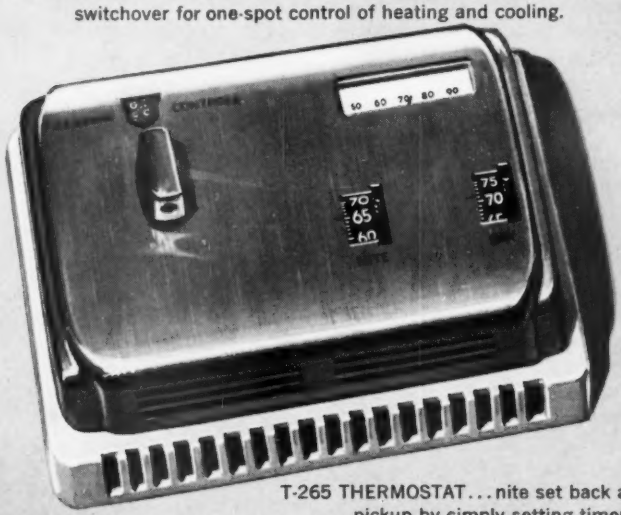
T-241 air conditioning mercury switch thermostat with automatic switchover for one-spot control of heating and cooling.



T-270 TEMPOTHERM electric clock thermostat for perfect day and night heating control the year round. Also available Model T-271 for heating and cooling.

T-265 THERMOSTAT... nite set back and automatic morning pickup by simply setting timer knob. Two-wire circuit... no extra transformer electrical connections.

House hunters come back to this model home!

. . . the women remember those gas top burners, equipped with the newest "burner with a brain"—the FLAME SET*.

There's a big difference between the old and this new FLAME SET "burner with a brain." With the old type, the flame starts and continues at *full height* until the pan heats to the preset temperature. Try it! Result? Scorching in small and in non-aluminum pans.

With this new FLAME SET "burner with a brain," women can now tailor the flame to fit the pan size: small pan . . . small flame—BIG pan . . . BIG flame! Women remember this selling feature.

Far superior to the old style "burner with a brain," the FLAME SET doesn't increase the cost of the unit! Before ordering built-ins, make sure they're equipped with FLAME SET—the *modern* "burner with a brain."

It's a sales feature that will be *remembered* by your house-hunting prospects!

*TRADEMARK

For complete FLAME SET information, write to Robertshaw Thermostat Division, Robertshaw-Fulton Controls Company, Youngwood, Pa.

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MR CONTROLS

TECHNICAL TRENDS

By GUY CORFIELD

The next five to fifteen years

We are being constantly confronted with predictions of what the Space Age will bring in our lives and in the lives of future generations. These predictions range from a decade or less to 100 years hence. The latter are obviously educated guesses, but the former are probably already blueprinted. It has been the observation of this writer that, when hints of new scientific and technical developments begin to appear repeatedly in the public press, they are already very near accomplishment if not already in limited actual use.

One of the most interesting of these predictions is entitled "Watch for These Space Age Changes," which appeared in the January 1959 issue of *Nation's Business*. It is written by an impressive team of 11 scientists and is focused on the next 15 years. A portion of it is quoted herewith. Italics have been added to indicate items of direct interest to the gas industry.

"For the foreseeable future, exploration of space is going to be a net drain on our economic resources, instead of an addition. The question during our lifetime is not going to be, 'What direct economic benefits can we expect from exploration of space?' but, 'How much can we afford to spend on space exploration, for the ultimate benefits it may bring to the human race—benefits we can as yet hardly visualize?'

"There are nevertheless some indirect benefits which may accrue from space exploration:

"1. Within five years, we can expect *markedly increased accuracy of short-range, and perhaps medium-range, weather forecasting*, as a result of exploration of nearby space by satellites; perhaps development of weather surveillance satellites; an increased understanding of our space-exploration program will bring knowledge of the dynamics of weather and the impact on it by the sun and by other space influences.

"2. Also within five years, we can expect markedly increased accuracy of short-range and medium-range prediction of radio propagation conditions and increased accuracy of measurement of current radio propagation conditions, which will enhance international communications.

"3. Within 10 years, we may expect to see commercial radio relay satellites which will give effective, reliable, round-the-world communications channels with hundreds or thousands of times the message-handling capacity we have today.

"4. Also within 10 years, *the development of so-called exotic high-performance fuels now used for missiles may reach the point where they are plentiful and cheap enough to compete with more conventional fuels for commercial applications.*

"5. Within 15 years, *long-range weather* and radio-transmission-conditions *forecasting may become accurate enough for confident use as a basis for commercial planning.*

"6. Also within 15 years, manned or unmanned rockets, which leave the atmosphere and get a large part of their lift ballistically, may become commercially competitive for long-distance transport between points on earth.

"7. In addition to these specific indirect benefits, there will, of course, be a *diffusion of more sophisticated engineering methods and more highly developed materials from space research into other areas of our technology* as, for instance, materials, processes, and engineering methods developed for aeronautics have influenced such fields as automobiles, marine and railroad engineering."

The entire 5-page article is fascinating reading. It can be obtained, for 15 cents, from *Nation's Business*, 1615 H St. N.W., Washington 6, D. C.

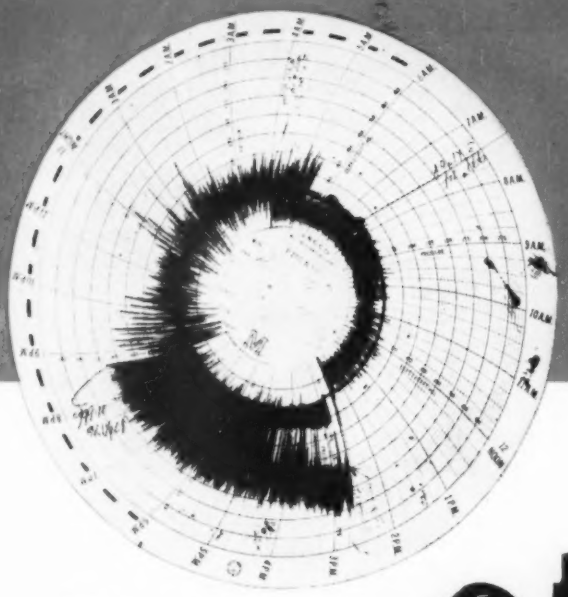
Molecular sieves

In Technical Trends, GAS, February 1955, mention was made of molecular sieves as a new development for separation of gases. It was stated that they might have application to the gas industry for dehydration and purification.

These "sieves" are actually synthetic zeolites (sodium or calcium aluminum silicates) heated to drive off chemically combined water. In pellet or rod form, they contain myriads of interconnected cavities of various molecular sizes. These can separate components of gases or liquids by a "straining" action. The large molecules are retained and the smaller ones pass through. They can be produced in a variety of "mesh" sizes. It is claimed that very accurate and complete separation can be made, requiring only that molecules of components are different sizes.

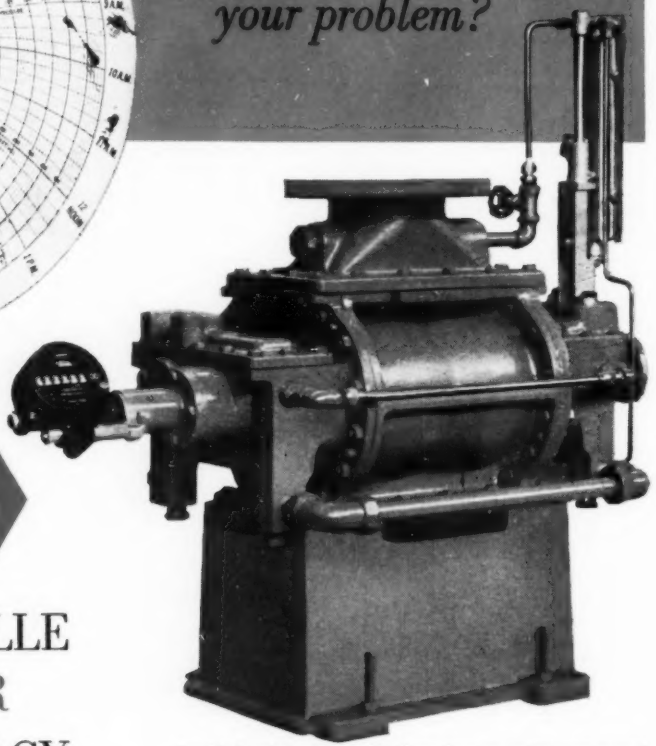
Based on results now available from field testing, use of molecular sieves for dehydration of natural gas, and removal of hydrogen sulfide, show definite possibility. This is indicated in a paper by E. L. Clark of the Linde Co., Houston, presented last March at the Gas Conditioning Conference sponsored by the University of Oklahoma Engineering Department at Norman.

Practical use of molecular sieves has been made for upgrading gasoline. Accurate cuts or separations of liquid hydrocarbons are made more efficiently than by fractionation. And, low-octane paraffins can be strained out to improve octane rating. Universal Oil Products calls this the Molex Process. Texaco refers to it as TSF (Texas Selective Finishing). ■



Are "paint brush" charts like this your problem?

Here is your easy-to-read solution.



Troubled with "paint brush" charts from an orifice-type recording meter used for testing wells, Shell installed the R-C Rotary Meter and now obtains clear and accurate data recorded on a punched tape along with other well test information.

ROOTS-CONNERSVILLE ROTARY GAS METER MAINTAINS ACCURACY AND READABILITY, EVEN WHEN FLOW RATES FLUCTUATE RAPIDLY

At Shell Oil offshore installations in the Gulf of Mexico, the oil and gas output of 16 or more wells passes through a single gathering platform before being piped to gas transmission lines, storage tanks and refineries. The gas flow from each well must be measured at intervals so that oil-gas ratios can be determined. Pressure in the well to be measured is reduced to 40 psig for metering, the oil separated, and the gas piped into a 4 x 8 high-pressure R-C rotary positive displacement meter. After a selected period of testing, this well is returned to normal operation and the next well switched in to test. The operation is continuous and automatic on whatever time cycle is chosen. The orifice meters previously used for measuring gas flow recorded the fluctuation in flow in such a way that instrument charts were difficult to integrate. Maintenance requirements were high and frequent chart readings necessary.

The R-C rotary meter accurately measures the fluctuating flows from each well and this accuracy is unaffected by continuous fluctuation. Well pressures range from 50 to 2000 psig. Direct readings, corrected to standard conditions can be taken from the meter or transmitted remotely. No stand-by personnel is needed to service the meter or read charts. Repetitive flow readings can be obtained to determine accurate oil-gas ratios.

R-C rotary positive displacement meters were selected as a result of field tests, which proved them most accurate in measuring the wide range and rapid fluctuations in flow rates.

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For additional data, please refer to pages 565-568 in Chemical Engineering Catalog, to our section in Mechanical Catalog or write for Bulletin M-258.

WASHINGTON

By NEIL REGEIMBAL
GAS Washington Bureau

Area pricing facing showdown

A BUDDING move within the Federal Power Commission to end the gas producer pricing tangle by using an "area price" system will probably hit a showdown when the Phillips case comes before it this fall.

At least two members of the commission approve the area price system. The Phillips case, as the original producer price control problem, is a natural vehicle for two reasons.

First, whatever decision the FPC reaches will undoubtedly be sent to the courts for review.

Second, the commission is faced with having to approve, disapprove, or modify Hearing Examiner Zwerdling's answer to the confusion—system-wide pricing.

Sources close to FPC say the commission is finally ready to try on its own to fish-or-cut-bait under the Supreme Court orders to control producer prices.

They know that gas legislation is dead for the foreseeable future —if not forever.

The legal jungle that has built up since that case by bits of cloudy precedent set by various courts has to be resolved, the commissioners are convinced.

FPC has already made some quiet moves in that direction. It has been asking producers in rate cases for some months for information for a "commodity" type of study, as advocated by the now-dead Harris gas bill.

Cost evidence, although requested, has not been used any more than required by the old "Detroit" case. In that case, the court said cost must be used as a starting point, although this was eased a little by another court in a case involving Forest Oil.

This market value or commodity approach may be extended to certificate cases and tied in with area pricing if its supporters on the commission can swing needed votes.

As envisioned by supporters, an area pricing method would set a commodity value ceiling on gas in a designated producing area (this would not necessarily be an average price). Existing contracts would be permitted to rise that high under escalation clauses without being questioned. A slightly higher "incentive" rate would be permitted for new producer contracts. This would take into account the inflated costs of new discoveries and encourage new development.

In some cases, these two ceilings for an area could be surpassed if a producer and customer could show that it was justified by public convenience and necessity. In a case where such a super-price were granted, it might in time pull the other ceilings upward too—but not in all cases.

An answer to the producer rate problem is especially pressing in view of the U. S. Supreme Court ruling in the CATCO.

The high court ruling, like other court admonitions before it, is perhaps a legal gem. But it is a practical nightmare. The court said FPC doesn't have to consider rates in all certificate cases—only those that "on (their face) signal the existence of a situation that probably would not be in the public interest."

This, like the ruling that ordered FPC to use cost as a starting point in rate increase proceedings, will supply FPC examiners and gas lawyers with constant and ever increasing business.

But it won't help producers, pipeliners, distributors, or consumers.

The area wide-market value approach may fail. The FPC may not agree on it, or its adoption without new legislation could be tossed out by the courts. If so, some other fairly firm yardstick will have to be found.

And it will have to be found soon.

Meanwhile, new gas legislation is still being introduced in Congress. Sen. Magnuson (D., Wash.), chairman of the Senate Interior Committee, recently tossed 19 bills into the hopper at the request of the Federal Power Commission, most of them dealing with natural gas.

None deals with the independent producer control problem.

The measures would provide greater government control over gas imports and exports; give FPC power to control sales of gas for resale for industrial use; give FPC power to allocate gas in emergencies; tighten controls on pipeline abandonments; eliminate certificates for pipeline extensions or enlargements; and permit FPC to refuse to admit a person as a party to a case if the same point of view is already adequately represented.

GOVERNMENT regulatory agencies, including FPC, aren't out of troubled waters yet.

Continued on page 84

THE MODERN TAPE...AT WORK FOR MODERN INDUSTRY

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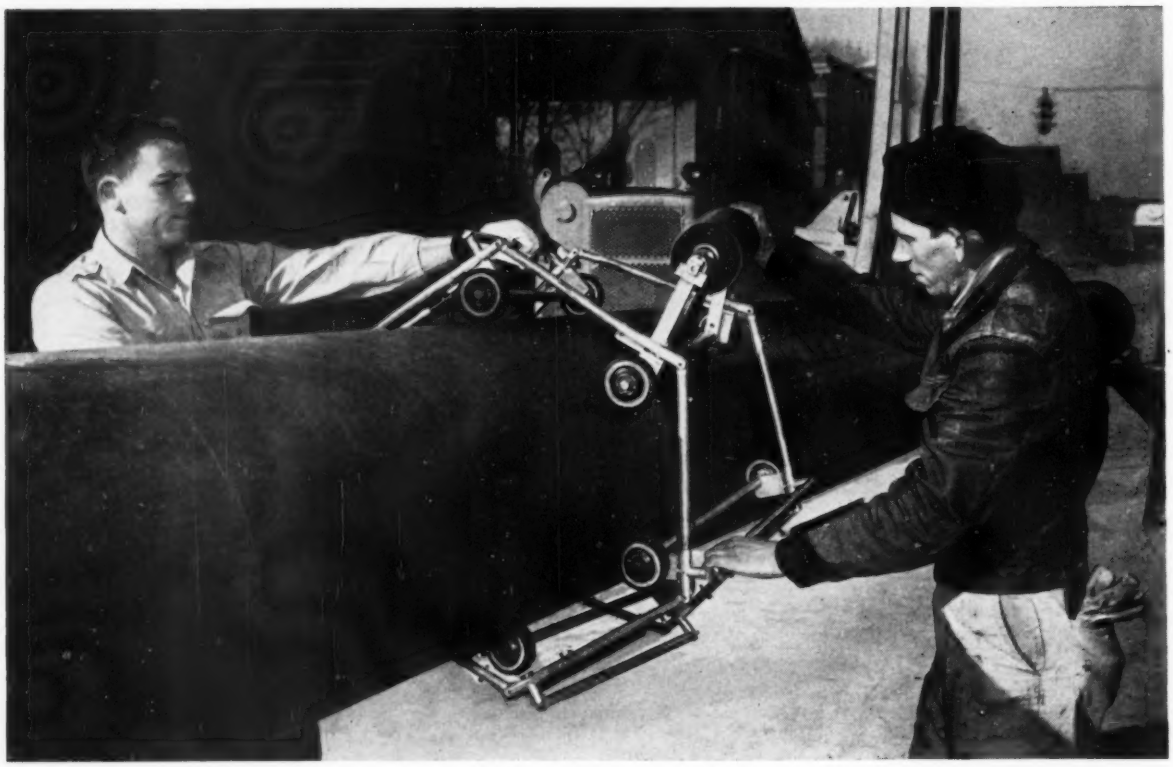

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By MARSHALL E. PARKER

More snares and pitfalls

LAST month we discussed some difficulties and complexities of installing and maintaining in good operation a cathodic protection system on a set of piping. Not all of these are mere accidental properties of the system itself or of its environment. Some of them are direct results of human activities—efforts to reach some desired end, but which succeed in doing something undesirable.

An example concerns a long, isolated, coated pipeline, apparently uniform in all important respects. The pipe-to-soil potential, measured to the conventional copper/copper-sulfate electrode, at a point near a rectifier, was 1.18 v. Successive readings, at a set of test leads at about equal spacing, were 1.07, 1.00, 0.62, 0.90, and 0.87.

Following these, the potential climbed in about the same way to the next rectifier. But what of that 0.62 reading? It was taken at a test lead at a minor road crossing, similar to many others on the same line. As the road had no casing, the mystery was profound. Finally, after a bar contact to the line gave the same value, the answer came to light. Actually, there was a casing at this crossing—but no vents—and, to complicate the problem, the test lead was attached to this casing!

A similar problem — although not properly in the category of human error—is that which confronts the corrosion engineer when he first gets a reading of, say, 190 mv to copper sulfate at a test lead. This is most likely to happen with a potentiometer, as a voltmeter, under these circumtances, will usually read very nearly zero. "These circumstances" mean a broken test lead —and the potential being measured is that of the exposed end of the copper wire in contact with the earth.

Other difficulties arise from what may be called unrecognized anodes and unrecognized cathodes. An example of the first was found when large parts of a gas distribution system on a military base were found to be well above the protective level, although no cathodic protection had ever been installed. Since the investigation was supposed to be limited to the gas system, it was hard to obtain the needed information and permission to investigate further afield. Eventually, however, it was disclosed that there were several thousand feet of buried cable on the base, all with a spiral wrap of galvanized sheath, and all solidly bonded in to the steel pipe of the gas system. The bare galvanized sheath had far more exposed area than did the coated gas pipe, so the latter was under very effective, although quite expensive, cathodic protection.

Unrecognized cathodes are usually copper; water pipes, ground rods, and grounding cables. Sometimes, in the vicinity of electrical or radio installations, these ground fields may be quite extensive. If, as is usually the case, they are connected to the steel we are trying to protect, they can indeed be a problem. In the first place, they are entirely bare; in the second, every square foot of copper will demand from four to ten times as much current as a square foot of steel, *before the steel can be brought to protection.* In the absence of any cathodic protection, the steel will be actively attacked, since it serves as an anode to protect the copper. The answer to this is not easy.

Two instances come to mind of ways in which the activities of the corrosion engineer himself can contribute to his confusion. On one occasion, an attempt was being made to run a current requirement test on a recently completed pipeline. A storage battery was being used as a source of power, draining current to a temporary ground bed. With an interrupter in the circuit, two potential readings were being obtained at each test lead. At least this was the case for the first few test leads. Then, just as the potentiometer was being balanced for the "off" reading at the next lead, the potential shifted again. Switching over to straight voltmeter circuitry, disclosed, after a few minutes, that there were *four* different potentials at that same point, succeeding each other in an irregular cycle of not more than one minute. It turned out, after considerable confusion, that another engineer was conducting a similar test on another part of the same system; and that there was no effective insulation between the two sections, as there should have been.

The other case also concerns a current requirement test on what was believed to be a well-coated line. Again a storage battery was used, and, for a temporary anode, an abandoned steel-pole which had formerly carried a floodlight. The response of the line was disappointingly low; several successive tests were run, at increasing values of current, until it became apparent that the current demand of this supposedly well-coated line exceeded that of bare pipe! However, the total current demand was quite inconsistent with the attenuation of

Continued on page 105

Sweet dreams for the gas man

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safety relief valves
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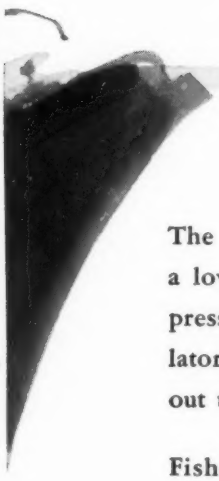

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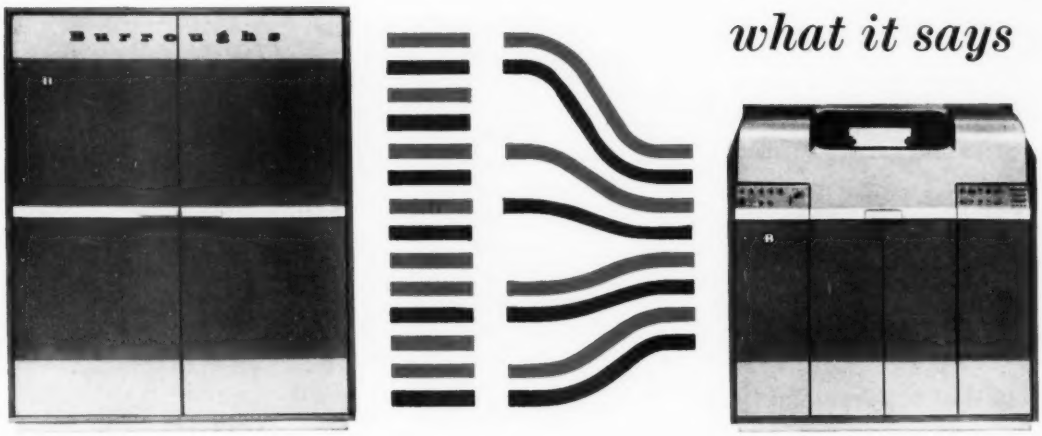

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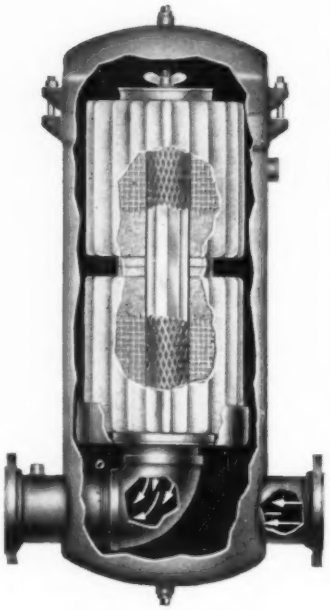

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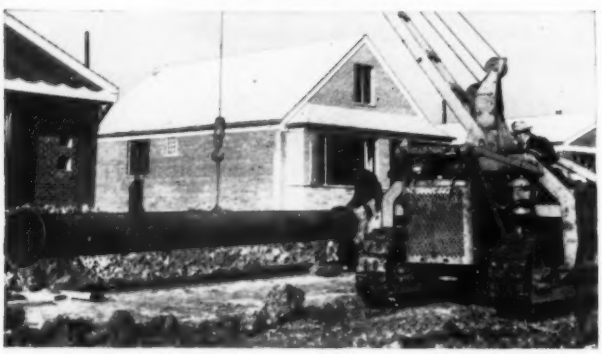

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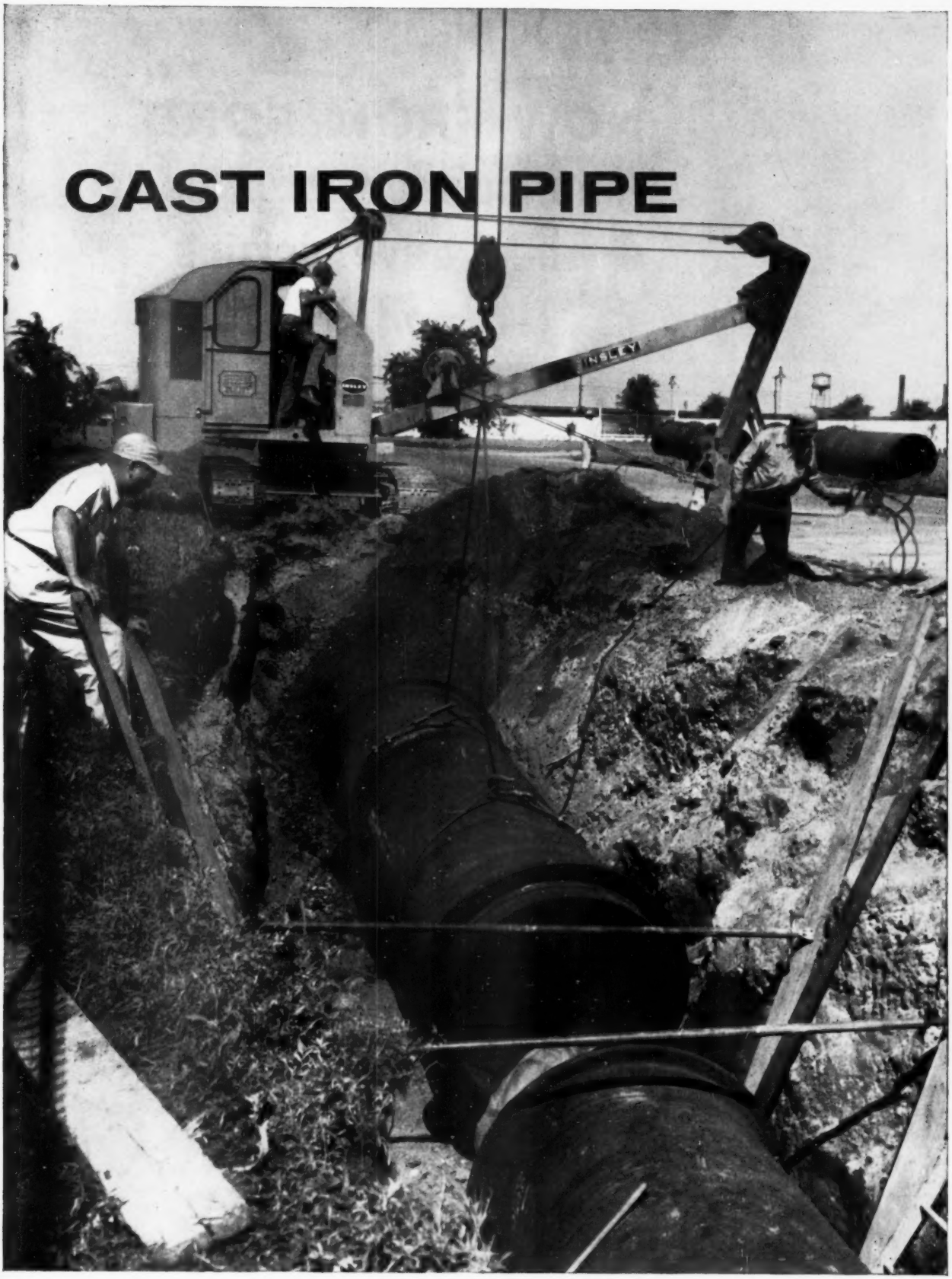
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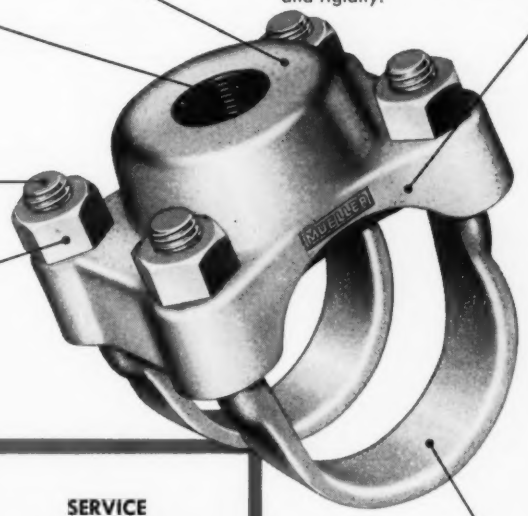

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Pipe sizes from 1" through 12".

Single or double strap type.

Heavy cadmium plating on strap and threads gives maximum resistance to corrosion. Black finish also available.

Forged steel straps, accurately curved to fit pipe, are as wide and flat as practicable to give maximum bearing and greater stability.

Flattened strap gives large contact area—increasing life of clamp by reducing effect of corrosion.

All Mueller Service Clamps now packed in labeled, corrugated cartons for ease in handling, shipping and storing.

These features are typical of the attention to detail in research, design and engineering that becomes a part of every Mueller product manufactured for the gas industry. Write for complete information.

NO-BLO®

MUELLER CO. Since 1857 SERVING the Water and Gas Industries QUALITY

MUELLER CO.

DECATUR, ILL.

Factories at: Decatur, Chattanooga, Los Angeles; In Canada: Mueller, Limited, Sarnia, Ontario

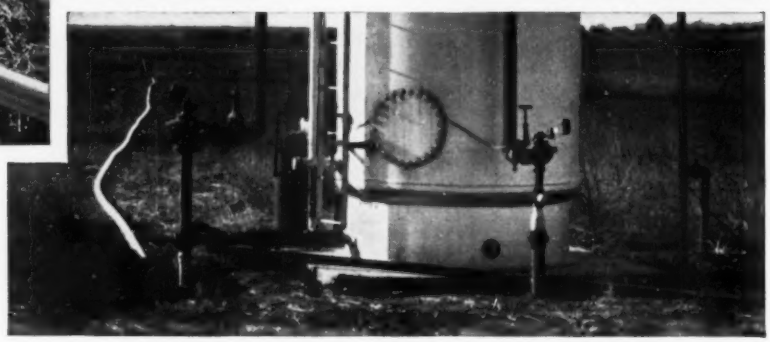
GEM Sponsor GAS 7 ways better

News about

B.F.Goodrich Chemical *raw materials*

Geon pipe running to tank battery and water separator in distance is concealed by freshly covered-over trench. Geon pipe is being used for oil and gas lead lines up to 250 psi working pressures.

Three-inch Geon pipe leads through fitting made of Geon into 4-inch salt water disposal pipe, also made of Geon.



Three-inch Geon pipe carries salt water from a crude oil de-watering tower to a disposal well 1000 feet away. It will be buried after a second line feeding into the disposal line is installed.

Hundreds of wells per year show how to . . .

save with pipe of Geon

Pipe made from Geon rigid vinyl saves time and work—it is so lightweight and easy to install. And maintenance costs are considerably lower.

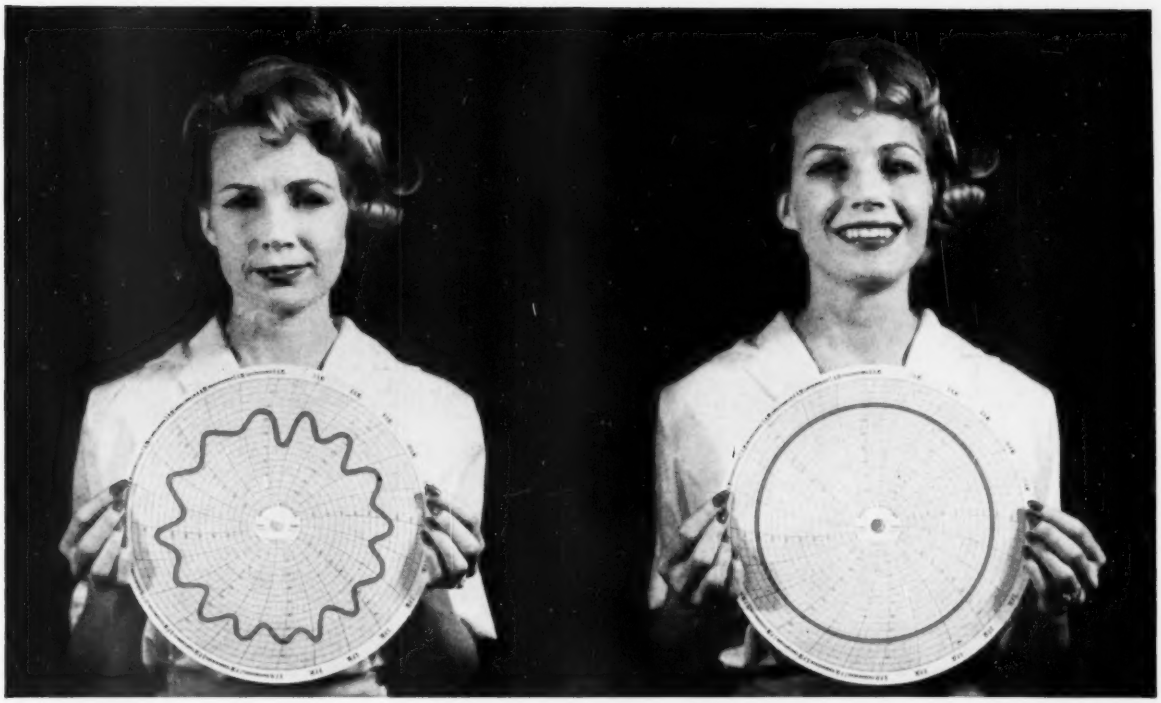
Pipe of Geon is immune to galvanic corrosion, is highly resistant both to salt water and sour crude oil. It stays smooth inside and out. And it provides high tensile or impact strength, standing up under pressure.

Engineers are taking advantage of the unique properties of Geon pipe for a wide variety of applications. For information on how you can cut costs by using pipe of Geon, write Dept. AP-4, B. F. Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

B.F.Goodrich Chemical Company
a division of The B.F.Goodrich Company

B.F.Goodrich

GEON polyvinyl materials • HYCAR rubber and latex
GOOD-RITE chemicals and plasticizers • HARMON colors



which housewife has YOUR furnace?

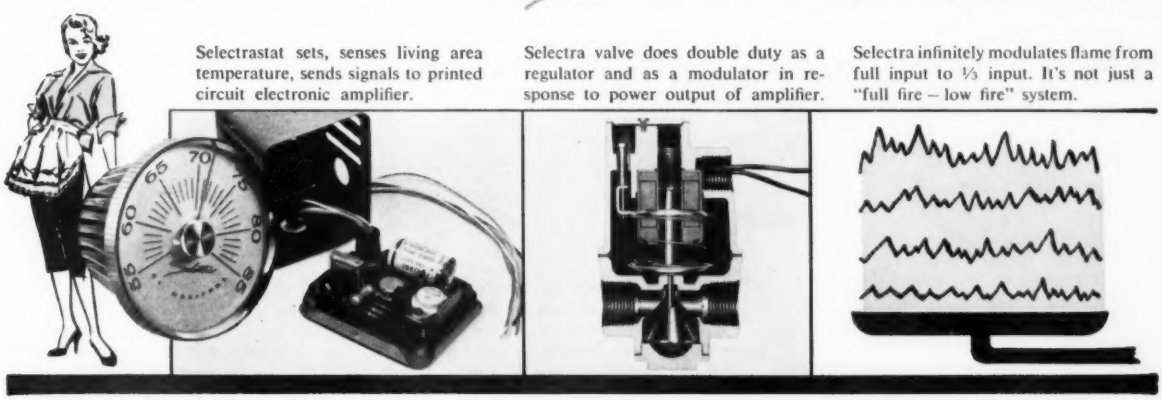
Don't be so hasty with your answer. Most gas fired forced air furnaces are today creating the crazy 24-hour temperature zig-zag you see at the left. The inertia of a full-on, full-off heating system just can't cope with a mild day: the furnace delivers more heat than needed to satisfy heat loss, or none at all. First a hot blast, then cold quiescence.

Now's the time to stop selling furnaces by the pound and make real comfort your big sales feature. The chart at right shows the even temperatures a few householders are already enjoying. Millions are waiting for this comfort and they're going to find it soon in Selectra-equipped furnaces.

Selectra electronic modulation controls the furnace flame in accordance with heat loss in living areas. It assures even, non-cyclic heat, eliminates hot blasts and dead air. If you don't have the story yet, send for eight-page brochure.

MAXITROL *Selectra*

MAXITROL COMPANY • 12200 BEECH ROAD • DETROIT 39, MICHIGAN



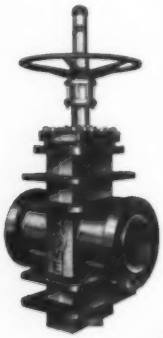
Selectrastat sets, senses living area temperature, sends signals to printed circuit electronic amplifier.

Selectra valve does double duty as a regulator and as a modulator in response to power output of amplifier.

Selectra infinitely modulates flame from full input to ⅓ input. It's not just a "full fire – low fire" system.

IN CASE OF ANY EMERGENCY

HERE'S THE VALVE YOU KNOW WILL WORK



This is a rugged, dependable valve you can forget until you really need it. When you do—it'll work. There's no wedging to cause wear and jamming. The polished gate slides easily and quickly between smooth metal seats and rugged "O" rings. Exclusive Grove design lets gate and seats float free—eliminates distorting effects of pipe-line strain, internal pressure and temperature. Requires as many as 250 less turns to close than some competitive valves, too.

And, there's no lubricant to forget or to be washed away. Tough, flexible "O" rings are always there when you need them to give a bubble tight seal every time.

The next time you need valves, call your Grove man. He has the valves you can really depend on.

GROVE VALVE and REGULATOR COMPANY

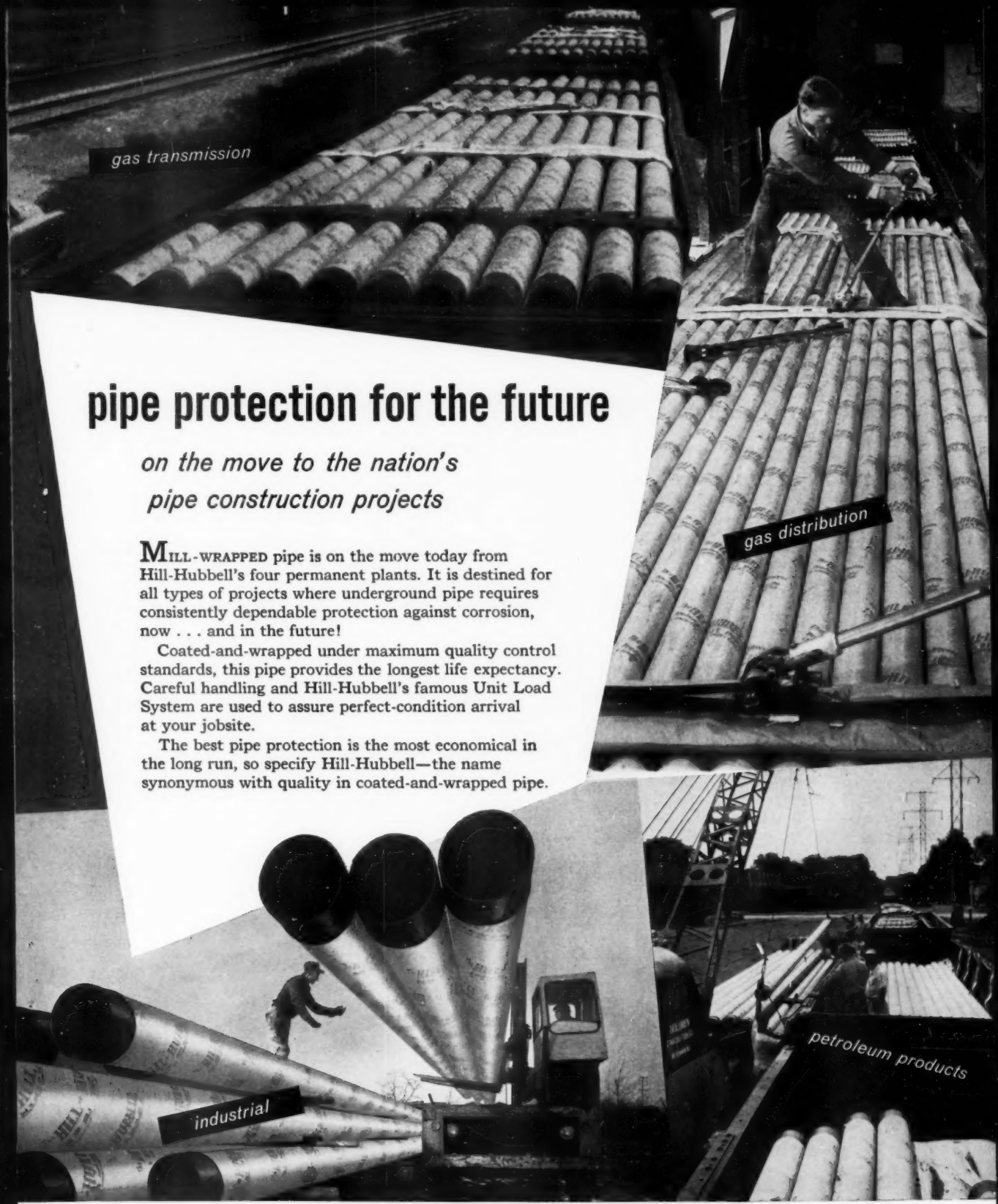
65th & Hollis Street, OAKLAND 8, California

HOUSTON 27—3203 Mercer St. • LOS ANGELES 6—2559 W. Olympic Blvd.

ODESSA • TULSA • DENVER • CHICAGO • NEW YORK • DALLAS • PITTSBURGH

FARMINGTON, N. M. • LAFAYETTE, LA. • HARVEY, LA. • LONGVIEW, TEXAS

In Western Canada: GROVE VALVE LTD., EDMONTON



pipe protection for the future

on the move to the nation's pipe construction projects

MILL-WRAPPED pipe is on the move today from Hill-Hubbell's four permanent plants. It is destined for all types of projects where underground pipe requires consistently dependable protection against corrosion, now . . . and in the future!

Coated-and-wrapped under maximum quality control standards, this pipe provides the longest life expectancy. Careful handling and Hill-Hubbell's famous Unit Load System are used to assure perfect-condition arrival at your jobsite.

The best pipe protection is the most economical in the long run, so specify Hill-Hubbell—the name synonymous with quality in coated-and-wrapped pipe.

Specify Hill-Hubbell wrapped pipe on your next job . . .

HILL·HUBBELL

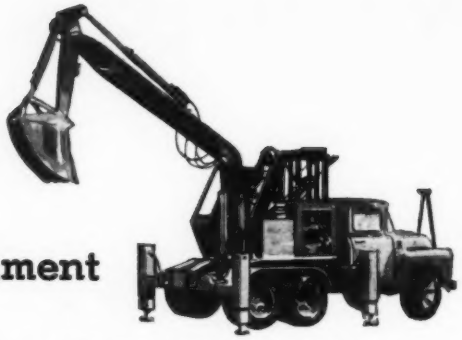
HILL-HUBBELL & CO. • 3091 MAYFIELD RD. • CLEVELAND 18, OHIO

FACTORY APPLICATORS OF COATINGS AND WRAPPINGS

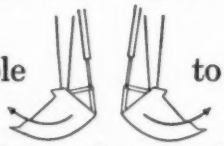
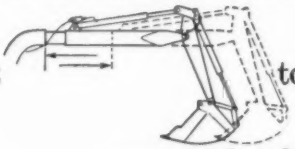
This is a

HYDROCRANE

...with a Hydrohoe attachment



and you can bet it's going to DIG because behind the teeth on that bucket is a combined total of 189,000 pounds of ram force! This machine has a combination of features that put it in a class by itself among half-yard hoes.

Here's why: The dippers for Hydrohoes, ranging from 24 to 60 inches wide, are reversible  to give you two-way digging action. Also, the dippers have hydraulic wrist action to bite in fast and hard. The boom on this hoe telescopes 4 feet  to give you efficient dumping reach for every job, eliminating unnecessary move-up time.

Who uses them? Municipalities, counties, utility companies, excavating and sewer contractors. Your distributor is ready to show you how they'll work *on your jobs*. Call him today, or write Dept. 14H59B, Bucyrus-Erie Company, South Milwaukee, Wisconsin.

BUCYRUS ERIE®

Builds Better Equipment

Water, water everywhere ...and not a spot of rust with U-BRAND BLACK "U-COTE"®

A Union Malleable exclusive . . . yours *at no extra cost* over regular black fittings.

"U-Cote"® fittings are clean, easy to work with and guarantee neater jobs and customer satisfaction—with maximum protection against rust and corrosion.

No other fittings on the market today can offer you such a 'bonus' as Union Malleable's Black "U-Cote"® Fittings.

Try them today!

U-Brand for ALL your fitting needs:

Galvanized and Black "U-Cote"® Fittings; Unions; Plugs; Cast Iron Drainage and Screwed Fittings; Steel Nipples and Couplings; Nylon, Brass, Steel and the exclusive Poly-Plus Blue Insert Fittings for flexible plastic pipe applications.

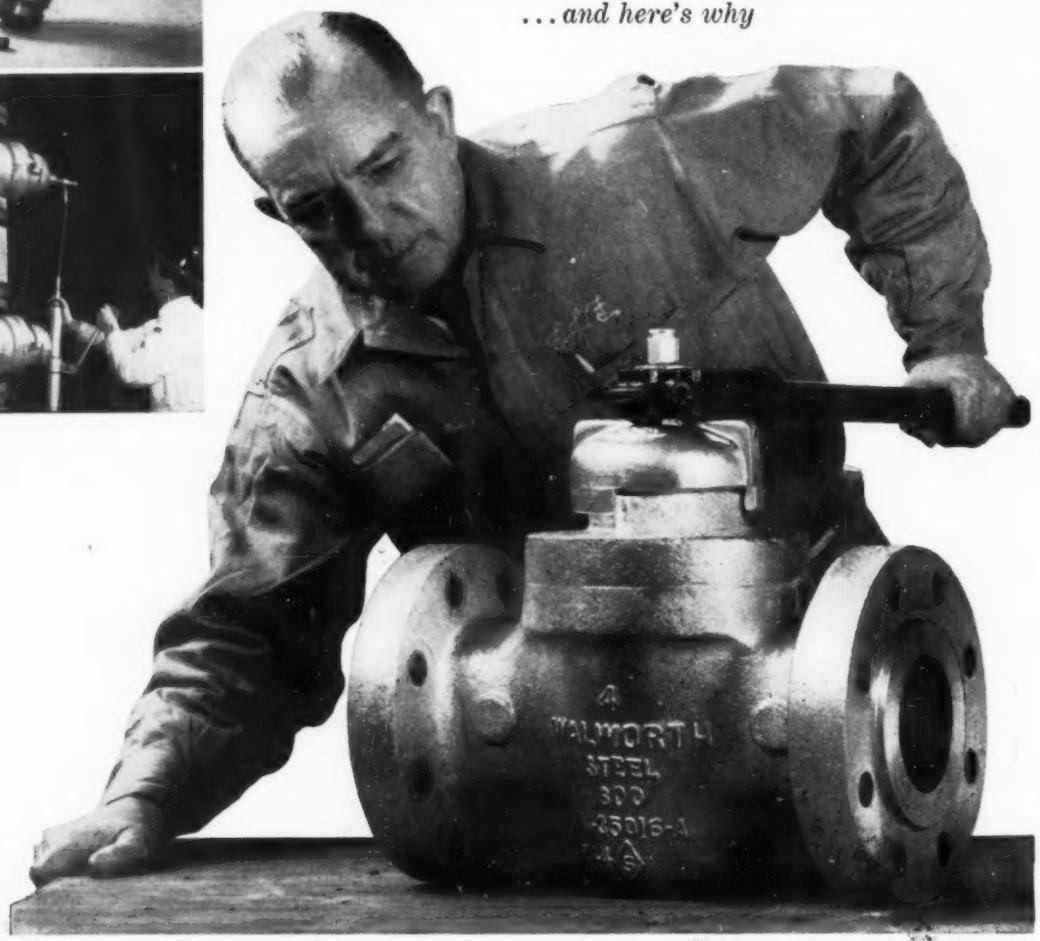
The Union Malleable Manufacturing Company

Ashland, Ohio · Vernon, Calif.

U-BRAND

the **WALWORTH CUSTOMER**
wants a quick operating,
sure, tight valve. He chooses a

WALWORTH
LUBRICATED PLUG VALVE
. . . and here's why



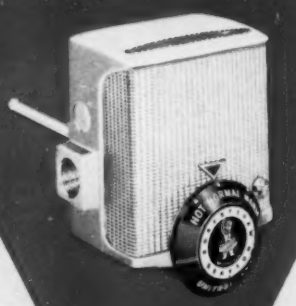
When the Walworth Customer has to decide on a valve that will close fast and easily, he wants to know HOW fast . . . HOW easily. Tight closure? Of course. But can the valve be serviced under pressure? Yes. Still, he tries one himself.

In the Walworth Lubricated Plug Valve he finds 100% tight closure because it is lubricant-sealed against leakage. He finds it opens or closes with a quarter turn. Then, and only then, he's ready to buy. If that's the way you like to buy valves, we want you, too, for a Walworth Customer. For details on all types and ratings of Walworth Lubricated Plug Valves, ask your Walworth Distributor.

Or write **WALWORTH** *750 Third Avenue, New York 17, N. Y.*
DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

WALWORTH SUBSIDIARIES: ALLOY STEEL PRODUCTS CO. • CONOFLOW CORPORATION • GROVE VALVE AND REGULATOR CO. M&H VALVE & FITTINGS CO. • SOUTHWEST FABRICATING & WELDING CO., INC. • WALWORTH COMPANY OF CANADA, LTD.

3 smart ways to push-up your water heater sales score!



Guaranteed by Good Housekeeping

SPECIFY ROBERTSHAW UNITROLS WITH BUILT-IN PRESSURE REGULATORS TO...INCREASE GAS BURNER RATINGS...IMPROVE IGNITION PERFORMANCE... IMPROVE YOUR WATER HEATER SALES APPEAL.

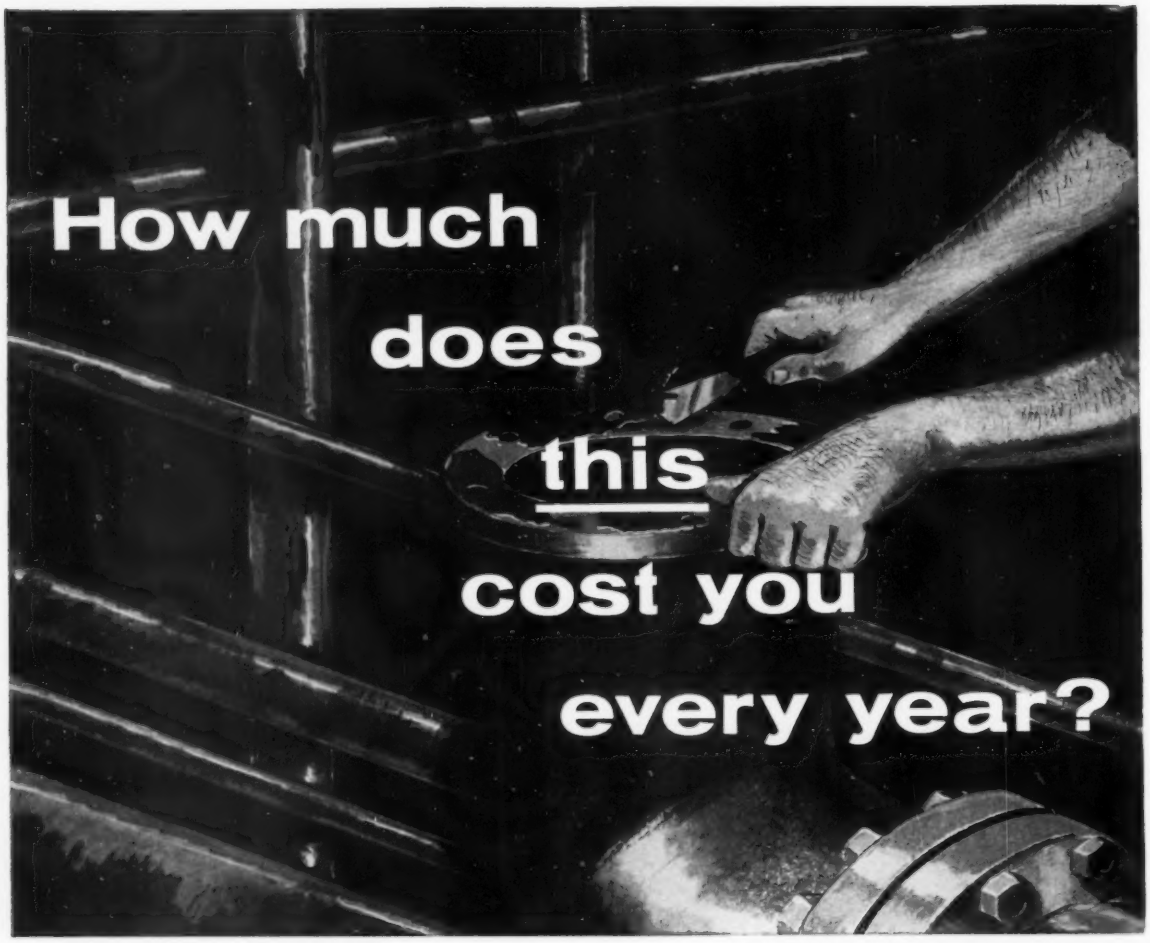
New Robertshaw Unitrols, with built-in pressure regulators, give your water heaters the smooth, modern look . . . clean design, no sharp corners, no dust-catching crevices. For a higher sales score, enable salesmen to demonstrate the smart new Unitrol 200R with its slip-top cover and concealed knobs . . . or best yet, the Unitrol 400R with the slip-top cover and the flip-top lid . . . *and* the ultimate in appearance. Robertshaw Unitrols with built-in pressure regulators also simplify your assembly and inventory problems! ■ Push-up your water heater sales *high* – specify the smart, new Unitrol 110R . . . *higher* with the smarter Unitrol 200R . . . *highest* with the fabulous Unitrol 400R – all with built-in pressure regulators.

FOR MORE INFORMATION, CONTACT:

Robertshaw

GRAYSON CONTROLS DIVISION • LONG BEACH, CALIFORNIA

Maintenance Cost Too High?



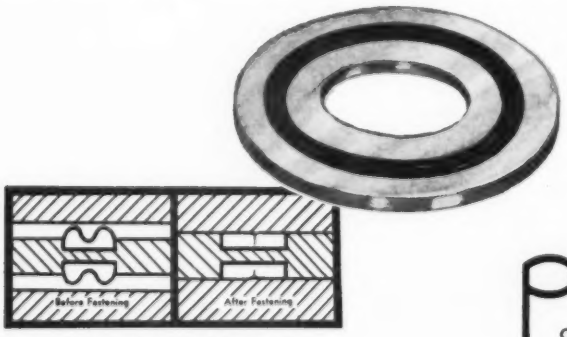
How much time, effort, and money is spent cleaning, resurfacing and/or replacing flanges to replace the seal!

Expensive? Yes!

Why not find out about Gask-O-Seals and save! Here are the facts: With Gask-O-Seal, flange faces require little or no cleaning or resurfacing of flanges when replacing the seal — *and Gask-O-Seals are re-usable.*

Gask-O-Seals save money and effort in many other ways, too. They are visually inspectable, do not need to be re-torqued, there is no material creep and they are non-directional, non-flexible, easy to install. They provide no-leakage sealing, *can not blow out,* and there is no wear due to pulse.

Now available to fit ASA standard flanges. Write for free catalog.



Note metal to metal contact.

Parker SEAL COMPANY

CULVER CITY, CALIFORNIA and CLEVELAND, OHIO

A DIVISION OF PARKER-HANNIFIN CORPORATION

NEW 175 c.f.h. METER...

Now there's a Superior aluminum case meter to meet every domestic requirement...the 175, the 250 and the 340 cfh sizes ...and each size gives you:

- ☐ ***Long-term accuracy*** built right in...slow movement... jig-assembled precision mechanism...sturdy cast table, always rigid...and a weather-resistant case.
- ☐ ***Easy Maintenance,*** whether it's adjusting the tangent through the handy access in the top...removing for easy access to the valves...or lifting out the valve table with the entire inner movement, simply loosening a few screws makes everything accessible.
- ☐ ***High Customer Appeal***...clean-cut and modern in appearance, these new aluminum case meters have been favorably received by utility customers everywhere.

Find out how this advanced-design meter will fit into your planning. Send for bulletin 1150...or take advantage of Superior's nationwide sales and service by phoning the representative nearest you.

SUPERIOR METER COMPANY, INC.

19 West 50th Street, New York 20, N.Y.

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17

...added to Superior

ALUMINUM CASE Line

Superior's 16 features:

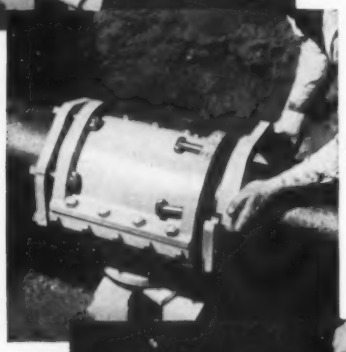
Slow movement saves wear • Simple seam easily sealed
Easy-access table • Remove top without disturbing index
Readily accessible valve seat • Gaskets stay resilient
Entire mechanism on lift-out table
Sintered bearings oiled for life • Smooth arm operation
Accurately-controlled diaphragm • Handy carrying lugs
Easy access for calibration • Stacks solidly
Index removable from front • Modern appearance
Conforms to A.G.A. standardization

THE ANSWER TO CONNECTION PROBLEMS

BRANCH CONNECTIONS

MADE UNDER PRESSURE

1



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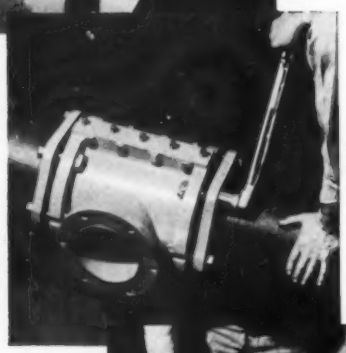

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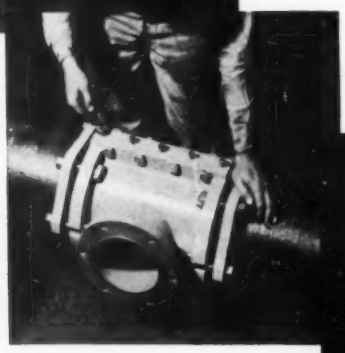

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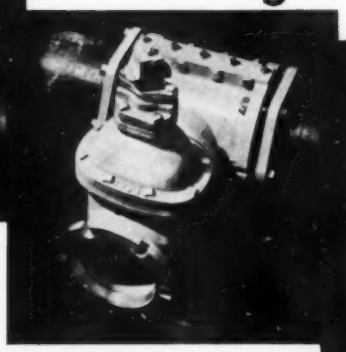
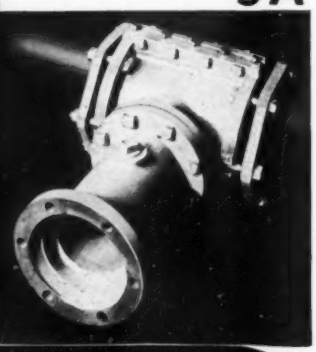


5A



The best and most economical method of making lateral or branch connections is to use Smith All Mechanical Joint Tapping Sleeves and Valves or Stopper Pieces. This method ELIMINATES GAS SHUT OFF and the permanent, leak-proof installation is achieved speedily by employing these simple procedures: 1. Block Sleeve Outlet Half under pipe, position side flange gaskets, bolt Sleeve halves together. 2. Position end joint gaskets; install follower rings, bolts and nuts. 3. Rotate Sleeve outlet flange to desired position, tighten follower ring nuts. 4. Tighten side flange gasket compression screws. 5. Attach Tapping Valve. The installation is complete and ready for tapping. 5. (Alternate) Stopper Pieces may be used in place of Valves when connections are made to low pressure mains and permanent shut off Valves are not needed; however, the use of Tapping Valves is recommended. The cost of the connection is reduced by quicker installation, elimination of skilled labor and costly jointing material. Bulletin will be sent on request.

51

FIRE HYDRANTS · VALVES · SINCE 1896

THE A.P. SMITH MFG. CO.

EAST ORANGE, NEW JERSEY

At Last...

A Truly Silent Automatic Gas Control

An Absolutely Quiet Control

THERMAC SLS 420 SERIES

Now, for the first time a truly silent automatic gas control. The new Thermac Delux "SLS 420" . . . a dream come true in the gas industry . . . combines in one unit the regulator, safety and automatic main gas control valve with or without 100% pilot shutoff.

Absolutely quiet in operation because there is no action to create noise. Utilizes a revolutionary new principle of operation for the diaphragm type automatic gas control valve. A low voltage (25 Volt, Low Temperature) Stainless Steel Rod and Tube Thermo Element does the work. Accelerated cycle tests simulating many years of service prove the control dependable and trouble-free.

Now, you can offer the warm air trade this outstanding improvement in controls—a strong appliance selling feature, the "SLS 420" by Thermac. Appliance manufacturers are urged to phone or write now for test samples.

Patent Pending

THERMAC COMPANY

Certified by A.G.A.

"27 years' experience building gas controls"

14296 EAST SIXTH STREET • CORONA, CALIFORNIA • REdwood 7-3511

REG. U.S. PAT. OFF.

SCOTCHRAP

BRAND

PIPE PROTECTION

Tapes are TOUGHER!

Proved by 200-hour torture test!

Each of the five lengths of pipe shown was covered with a different protective coating—both tapes and mill coatings. They were then fastened in a barrel containing abrasive tumbling chips and continually tumbled for 200 hours. This unretouched photo shows the results: only the "SCOTCHRAP" Pipe Protection Tape, far right, survived intact!

This controlled test was designed to measure the resistances of various coatings to backfilling and soil stresses. It clearly demonstrates the superior abrasion and puncture resistance and excellent bond strength you get *only* with "SCOTCHRAP"—the toughest polyvinyl chloride plastic tape. These properties are so superior that with normal care, no protective overwrap is needed. Add the excellent electric properties, and you have the reasons why we believe "SCOTCHRAP" is the best total coating buy you can make.

SEND FOR FREE MANUAL!
New "Tape it Easy" booklet gives application methods, useful specifications, for "SCOTCHRAP" Pipe Protection Products. Write 3M Co., St. Paul 6, Minn., Dept. EAL-99.

FOR MAXIMUM ABRASION RESISTANCE...
EXCELLENT PUNCTURE RESISTANCE...
MAXIMUM RESISTANCE TO SOIL STRESS...

***PLUS* EXCELLENT ELECTRICAL PROPERTIES**

SPECIFY

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SCOTCHRAP Pipe Protection Products

BRAND

The term "SCOTCHRAP" is a registered trademark of Minnesota Mining and Mfg. Co., St. Paul 6, Minn. Export Sales Office: 99 Park Avenue, New York 16, N.Y. In Canada: P.O. Box 757, London, Ontario.

MINNESOTA MINING AND MANUFACTURING COMPANY

...WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

Why drill services?
PUNCH 'em!

A new way for taking services off mains. A quick, safe welding tee that incorporates in each tee a punch and positive shut-off . . . doing away entirely with the use of drill devices. Punch size, 3/8" or smaller.

We also have a model for use with saddles, threaded at the base to screw into the saddle.

Each tee is tested to 5,000 p.s.i. hydraulic pressure, and carries "Rated 1,000 pounds". A 5 to 1 safety factor. A real high pressure tee. Made from steel similar to pipe, it welds easily, and in the saddle model, takes a perfect thread.

Both sizes made have 1" base. Side outlet can be furnished 3/4" or 1", end beveled for welding, standard pipe size, either threaded, or smooth for compression coupling. Or outlet can be internally threaded for 1/2" pipe size.

With this tee you will be forever free from the cost of drilling machines, broken drills and drill machine maintenance and repairs. We feel this tee is the finest service improvement ever offered to the gas industry. Write for circular with installation instructions.

M. B. SKINNER CO.
SOUTH BEND 21, INDIANA

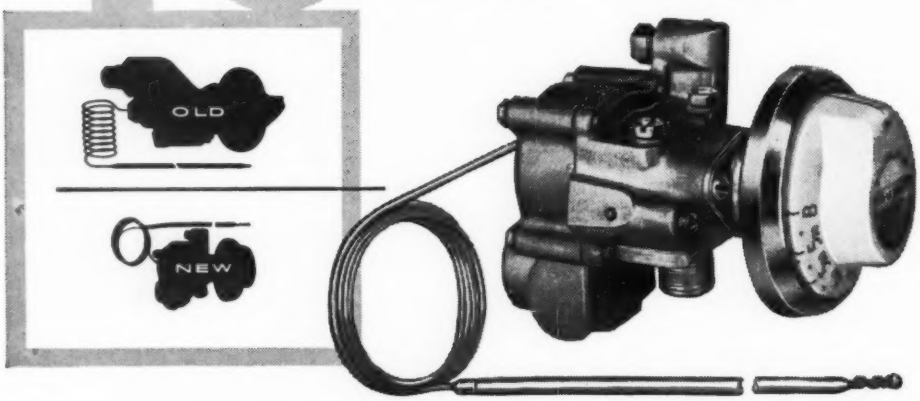
SKINNER-SEAL PUNCH-IT TEE

NEW WILCOLATOR **MODEL X** CONTROL

40% smaller

Permits more compact manifold design

Fits sloping front valve panels



New Wilcolator Model X oven control is 40% smaller than previous C-5 model, helps you design more compact manifold assemblies. Can be installed on sloping front valve panels without interference with burner box.

Wilcolator Model X High Capacity Gas Valve and Oven Thermostat

Temperature range: 200-550°F, plus broil

AGA rating, Btu/hr:
Manufactured gas—49,000
Natural gas—72,500
LP gas—154,400

The Wilcolator Model X takes up less space behind the valve panel than conventional controls, permits a more compact installation, such as required on waterfall ranges. And because its centerline dimensions match those of a standard gas cock, it also eliminates flattening or bumping the manifold, thus helping you cut costs through standardization of manifold design. For complete information on this new high-capacity oven control, request Bulletin 547 (for ranges with automatic oven ignition, please specify Bulletin 548 —Model XC).

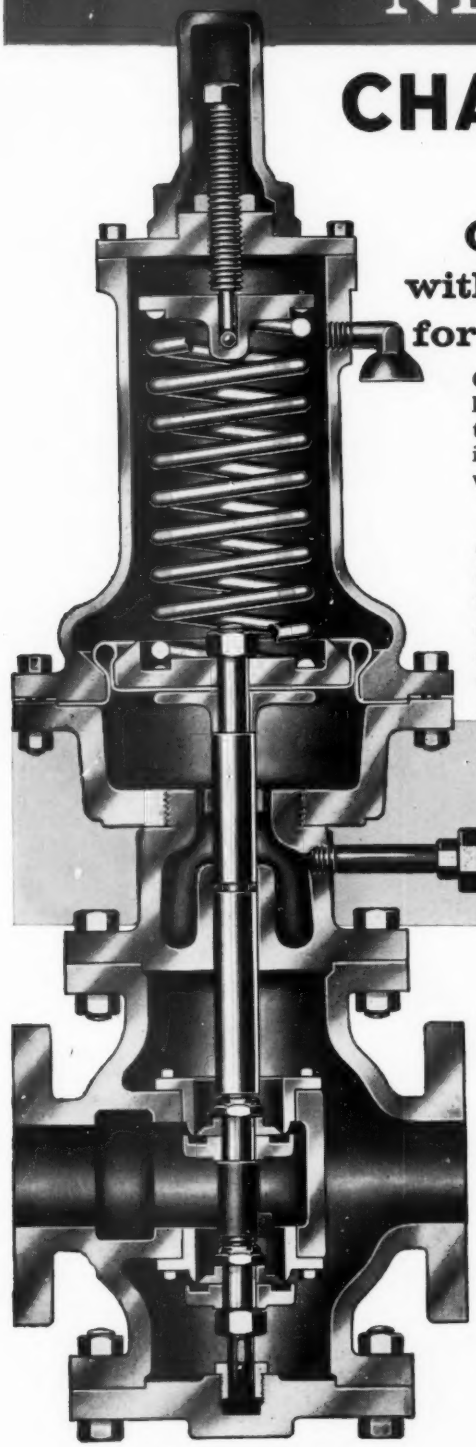
Thermostats for Every Heating and Cooling Application

THE Wilcolator COMPANY

THE WILCOLATOR COMPANY
1001 NEWARK AVE., ELIZABETH, N. J.

In Canada: Wilcolator (Canada) Ltd.
221 Evans Ave., Toronto 14, Ont.

NEW IN PRINCIPLE!
NEW IN DESIGN!



CHAPLIN-FULTON

Model 57-S

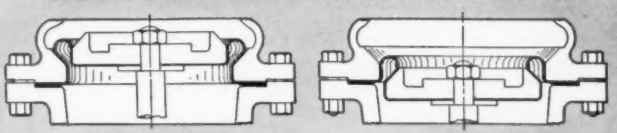
GAS REGULATOR
with "ROLL-OUT" Diaphragm for constant pressure control

Chaplin-Fulton Model 57-S is a simple spring loaded regulator which performs like a pilot loaded regulator, without the added complications. For pounds-to-pounds service—inlet pressures to 400 psi—controlled pressures to 75 psi, with deviation through full valve travel less than 1 psi.

NO "FALL-OFF" AS FLOW INCREASES

The drooping characteristics or outlet pressure "fall-off", typical of conventional spring regulators, is eliminated—not by using an uncontrollable velocity effect—but by a new diaphragm design which actually reverses the action of a conventional diaphragm. It changes its area as the valve opens to compensate for the loss in spring loading force.

"ROLL-OUT" DIAPHRAGM PRINCIPLE



VALVE CLOSED VALVE OPEN

Note how, with the valve upwards in the closed position, the diaphragm achieves its maximum effective area—and decreases as the valve opens. The area changes at the same rate as the spring loses compression, to give a constant controlled pressure—determined entirely by valve movement.

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Every yard of the coated fabric that goes into a Reeves Vulcan Diaphragm is thoroughly inspected and checked on a Multiple-Head Gauge so sensitive that it indicates the minutest variations in gauge.

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Over twenty years ago, Reeves Vulcan began pioneering a tough policy about its diaphragms: every one has to pass *14 rigorous quality-control tests.* Reeves Vulcan has found this the only way of guaranteeing you accurate gas metering and regulation . . . quality control from raw material to finished product.

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7 WAYS BETTER

1. **EASY-TO-LOCATE.** *You save time and money* because the built-in magnet and aluminum plate in H-B curb boxes make them easy to find with either magnetic or electronic finders.

2. **STRESS-FREE.** H-B curb boxes *save you money.* They telescope easily, prevent damage to service stops and piping.

3. **LIGHT IN WEIGHT.** 7 times lighter than cast iron, H-B curb boxes *save you money* because they are easier to handle. Cut installation time.

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IT WILL PAY YOU to specify Handley Brown Curb Boxes. Leading gas utilities all over the Country (names on request), are making the switch to H-B after rigorous on-site tests. A representative will be glad to show you the advantages. Write today for information.

End call backs with attractive H-B outside meter boxes. Available as shown, or for recessed installation. Made of tough resin-rubber compound*.

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Motorola ends costly power drain problems and idling expense with the first fully transistorized receiver and power supply

What makes Motorola MOTRAC radio the most economical and reliable 2-way radio unit in the annals of mobile communications? Not just one or two new features, but a score of revolutionary design advancements that bring you the very finest set ever engineered.

1. On standby—the MOTRAC receiver draws only a trickle of current—actually 80% less than conventional units—with an occasional increase to maintain crystals at proper temperature for precise on-frequency operation (even your dome light draws more current than MOTRAC radio). Yet, this radio is always poised for instant reception, thanks to its fully transistorized receiver. Result: no life-shortening battery drain . . . no more costly, unnecessary engine idling.

2. MOTRAC radio eliminates the most common maintenance problems: vibrators in the power supply and tubes in the receiver. All are replaced by stabilized long-life transistors.

3. Up to 40°F cooler operation means less aging and strain on components. Reason: no more receiver tube filaments; a more efficient power supply; a battery saver switch to cut off transmitter filaments; and two separate heat sinks—one for power supply, another for transmitter output tubes.

4. The MOTRAC receiver operates directly from the 12-volt battery; its low voltage operation results in less electrical strain on components, assures long life.

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6. Patient production testing continues under stringent quality control procedures. First, each module is tested. Then each chassis is independently checked. Next, each radio is tested as a composite whole. Finally, the entire radio and associated accessories are checked out as a complete operating system.

7. MOTRAC radio is conservatively designed. The receiver has *even higher* reserve gain than conventional Motorola units to assure *peak performance* for many years. Also, power supply transistors are operated under an exceptionally high safety factor to assure extended service life.

8. Completely independent receiver and transmitter chassis, with no power supply in common, assure reliable reception regardless of transmitter performance.

9. MOTRAC radio offers you 2½ to 3 times higher audio output than conventional sets.

10. MOTRAC radio is designed for split-channel operation. *Both* receiver and transmitter meet critical split-channel stability frequency requirements.

Experienced users have been field testing MOTRAC radios for many months. The results are in—and they're excellent. We'd like to tell you *all* about them. Write, wire or call: Motorola Communications & Electronics, Inc., A Subsidiary of Motorola, Inc., 4501 West Augusta Blvd., Chicago 51, Ill., SP 2-6500. MOTRAC is a Motorola, Inc. trademark.

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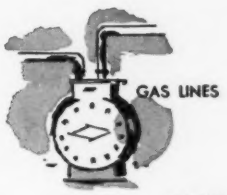

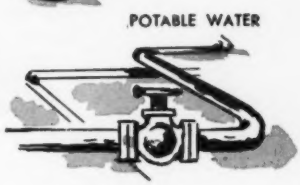

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Now there are two types of ABS rigid plastic pipe made of Cycolac, the *tough* thermoplastic. The original Borg-Warner Cycolac L ABS Type I resin has already proved its worth in scores of applications from coast to coast.

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To users of pipe, Cycolac C offers superior service over a greater range of temperatures with increased chemical resistance.

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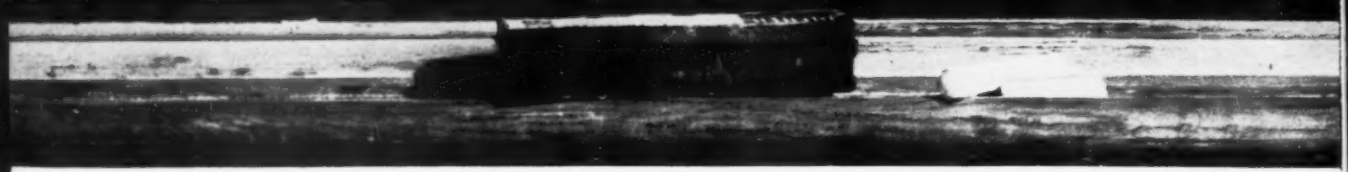
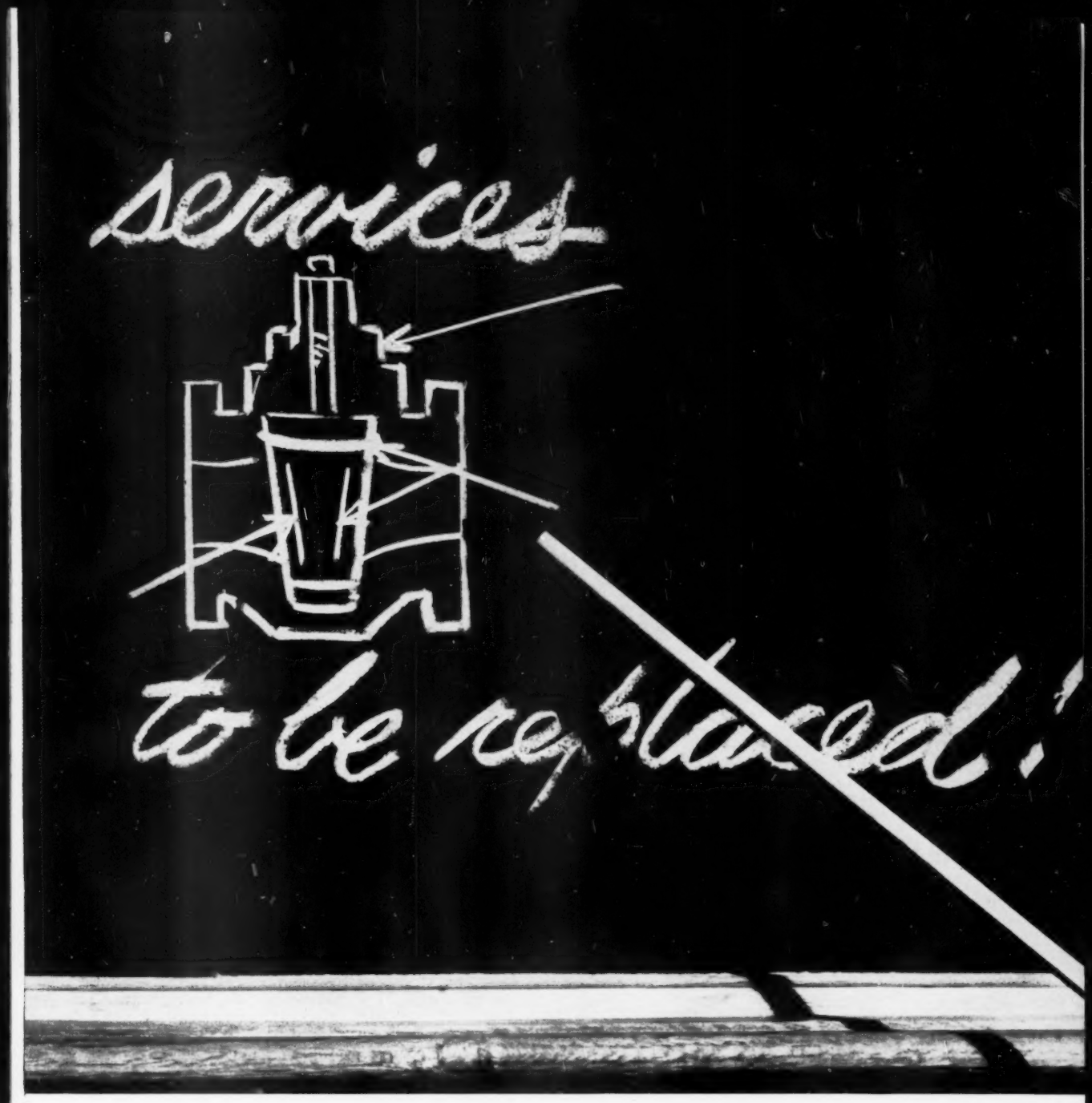
On most this valve never needs



There are a few valve-killing services where Rockwell-Nordstrom valves *do* fail—after outlasting non-lubricated valves by ten or twenty times. But on *most* services—when properly specified and properly maintained—they last as long as the installation of which they're a part. This is why: Rockwell-Nordstrom valves are *lubricated.* Pressurized lubricant in the Sealdport system does three things. 1) It creates a powerful leak-proof seal that can't be permanently damaged because it *renews itself.* 2) By hydraulically cushioning the plug, lubricant *prevents freezing and jamming.* 3) Lubricant protects every moving part against wearing *friction* and no vital part is exposed to the line. The lubri-

Lubrication makes the



cation largely eliminates the *causes* of valve failure. How much would you save if you had a valve that never needed to be replaced—or that outlasted your present valves by ten or twenty times? Try just *one* Rockwell-Nordstrom Valve on your toughest service. *Rockwell Manufacturing Co., Pittsburgh 8, Pa. Canadian Valve Licensee: Peacock Brothers Ltd.*

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another fine product by

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difference . . . . . .

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Gives you optimum level efficiency in distribution, transmission, storage!

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Combining large memory (4096 words) and stored-program operation, the LGP-30 gives you twice the capacity of any computer in its class . . . is by far the easiest to program in basic machine language. Answers are printed out directly—require no deciphering. What's more, auxiliary high-speed input-output equipment is available for system expansion.

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For further information and specifications, write Royal McBee Corporation, Data Processing Division, Port Chester, N. Y. In Canada: The McBee Company, Ltd., 179 Bartley Drive, Toronto 16.

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GAS "BURNERS WITH BRAINS" in today's kitchen . . . most recent achievement of the gas industry . . . "feel" and control heat in pots and pans . . . make cooking automatic . . . a pleasure!

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Holan service bodies last for years and years

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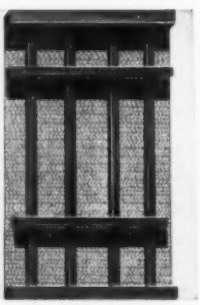

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one-piece, automotive-type fender and panel

There *is* a difference in gas bodies—and this one has the difference.

All Holan Gas Meter Service Bodies are made of long-lasting, corrosion-resisting high-tensile steel. And they have countless features that give you extra years of service. For instance, the compartment doors have double panels, concealed nylon hinges, door checks and indented handles.

Vertical and horizontal compartments carry copper tubing, conduit and all your miscellaneous parts and equipment. In addition, there is extra room for gas meters in the bed of the truck as well as in compartments.

Look over the features at the left—and ask your Holan Field Representative to show you more.

Holan Corporation, 4100 West 150th Street, Cleveland 35, Ohio
***Plants in* Cleveland, Ohio; Griffin, Georgia; Phoenix, Arizona**

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COMPARE

CAPTAN odorant sales with those of ANY other brand . . .

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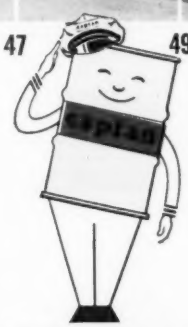

ASK FOR THE NEW COMPLETE "ODORIZATION MANUAL BY CAPTAN"

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CAPTAN outsells all other gas odorants.

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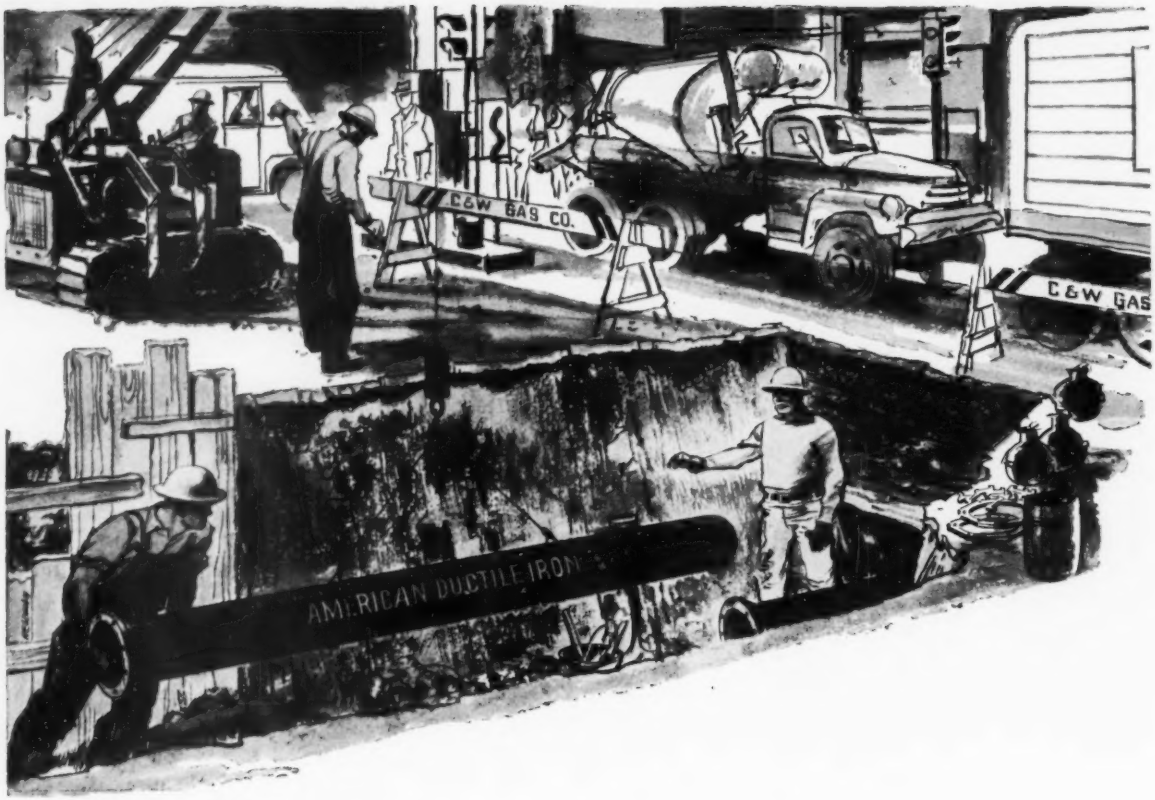

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Produced from a new family of cast metals, American Ductile offers important advantages of both iron and steel. It has the time-proven corrosion resistance of gray cast iron . . . and yet has high strength to withstand extreme loads. It will actually bend under stress.

If you expect the extreme conditions, investigate American Ductile Iron Pipe. Your nearby American Cast Iron Pipe Company sales office or representative will furnish complete facts.

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Greater built-in brawn than common to utility-type tractors provides an extra margin of stamina . . . traction . . . dependability—boosts production on all digging, loading, dozing, and hauling operations.

Tractor model	Max. flywheel horsepower*	No. of cyl.	Drawbar horsepower*	Diesel & LPG engines	Base working weight, lb.†	Speeds forward	Power Steering
Cub Lo-Boy	13.4	4	10.08	—	1,895	3	—
I-240 Utility	38.5	4	28.91	—	3,637	4	yes
I-340 Utility	45.0	4	32.41	—	4,365	5 or 10#	yes
T-340 Crawler	45.0	4	31.00	—	5,600	5 or 8#	—
I-460 Utility	61.0	6	48.15	yes	5,015	5 or 10#	yes
I-560	72.5	6	59.47	yes	6,563	5 or 10#	yes
I-660	95.0	6	72.00	yes	8,180	5 or 10#	yes

*At standard sea level conditions

with Torque Amplifier Drive

† with 175-lb operator, no added weight

See your **INTERNATIONAL HARVESTER** dealer

International Harvester Products *pay for themselves in use* —Farm Tractors and Equipment . . . Twine . . . Industrial Tractors and Equipment . . . Motor Trucks . . . Construction Equipment —General Office, Chicago 1, Illinois.

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AL-250

- Light weight reduces shipping, handling and setting costs.
- One-piece aluminum alloy pressure die-cast body... 5 psi working pressure.
- Molded, 3-convolution Duramic diaphragms for all fuel gas services.
- Modern design and attractive appearance insures customer acceptance.

5B-225

American AL-250 Aluminumcase meter, rated at 250 cfh, operates at only 7 revolutions per cubic foot for sustained accuracy through greater power and slow-speed operation. Ideal for home heating and small commercial loads.

American 5B-225 Aluminumcase meter, rated at 225 cfh, operates at the conventional nine revolutions per cubic foot and is comparable with the standard 5B Ironcase meter... for most domestic services.

GEM *See Playhouse 90 on CBS-TV. Consult local listings for time and station.*

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METER COMPANY
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GAS

SEPTEMBER 1959

D. B. Wilson (center), superintendent of operations, discusses a maintenance problem with two members of the regulator crew before they enter the vault to tackle it.

Design and installation of standardized regulator vaults

SINCE 1956 New Haven (Conn.) Gas Co. has been installing open-pit sidewalk regulator vaults. They are designed by the engineering department under the direction of B. D. Wilson, superintendent of operations. Seven vaults have been installed and four more are planned for this year.

Advantages such as ease of access, safety, adequate lights, good ventilation and freedom from traffic hazards make these vaults highly desirable. All contribute to ease with which regulators can be serviced.

The company has standardized on two sizes of vaults. Larger ones occupy a floor area of 5 x 7 ft

By WILLIAM T. HARPER, Eastern Editor

GAS staff report

For the sake of comparison, here is a maintenance man emerging from the pit through a manhole.

and are about 7 ft deep. The others are 5 x 5 x 5 ft. The larger design houses 6-in. Rockwell regulators. Fisher 99s go in the smaller ones. Six-in. regulators are equipped with either 3- or 4-in. valves. A dust strainer designed by New Haven Gas is included in each of the larger pits. These regulators handle the company's 660 Btu mixed gas—30 per cent natural and 70 per cent coke oven. The low pressure system is operated at approximately 6-7½-in. wc. The high pressure system is operated at pressures varying from 5-20 psig.

It takes about a week to install one of the smaller pits from groundbreak to final covering. In selecting a location, the prime thought is to keep it out of the roadway. If it is not possible to get a location in a sidewalk area, the company has picked locations in small parks or grass plots owned by the public and away from both sidewalk and street. Digging a pit and pouring the concrete floor can usually be accomplished the first day. After the concrete hardens, cinder block walls (sometimes concrete) are set up. This takes another day. The pit is then closed for about 48 hours to let the concrete set. Finally, piping is put in and a Bilco vault door cover is installed. Wherever possible, piping is fabricated and assembled in the shop so that a good fit is assured when installed in the vault. Piping is then dismantled, taken to the job, and reassembled. Sleeves through the pit walls for inlet and outlet piping are first installed as a single sleeve running the entire length of the pit plus about 3 or 4 ft on each. This results in a single piece of pipe that is about 8 ft longer than the pit. Then, after the concrete sets, the pipe is burned off flush with the inside of the wall. That leaves two sleeves exactly in line. The gas piping and the external end of each sleeve is fitted with a reducing Dresser coupling. This makes a water tight and concentric connection. An exterior shutoff valve is installed at least 25 ft away from the pit on high pressure lines.

All piping and vault construction is designed in accordance with the American Standard Code for Pressure Piping. The outside vent ducts are usually used as standards for mounting spring-wound recording pressure gauges which show inlet and outlet pressures of the regulator.

Screwed fittings are avoided whenever possible in favor of welded joints.

Occasionally, the lay of the land will not permit the company sidewalk width desired for a vault. In this case, a special adaptation is used. In one of the original larger pits, the regulator by-pass piping was run to the side of the regulator. In a latter installation, in order to use a pit of less width, the regulator by-pass piping was rolled into a vertical position directly above the regulator. This resulted in a narrower, but deeper pit. In this installation the bottom of the pit was about two ft wider than the top. This was accomplished by corbelling the wall starting about 2 ft from the top.

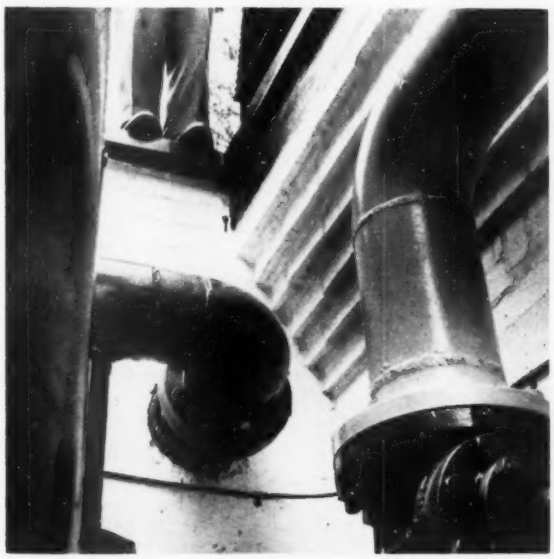
The company's first attempt with the open type pit came in 1950 and was not exactly a complete success.

The second try, in 1952, was to install ordinary vaults in the sidewalk, using a square 30 x 30-in.

The smaller 5x5x5-ft vaults (above and below) are easy to enter and easy to work in. Regulator maintenance man shows ease of access plus adequate light and ventilation in one of them.

Different color paints (above) show upstream and downstream sides of the system. There is plenty of room and accessibility to valves and other equipment.

When opening of vault is limited, New Haven Gas corbells one of the walls (below), thus making the lower area of the vault meet the required width.



Bilco cover in place of the 30-in. manhole cover. This gave somewhat more access. The addition of a 24-in. manhole cover also gave slightly more light and ventilation. The third attempt resulted in the present setup.

Drainage is no longer a problem for New Haven Gas Co. in locations where pits have been used. All piping and regulators are set well above the floor of the pit. A small sump is installed in each pit and if necessary, after an extremely heavy rainfall, crews can open the pit and use a portable gasoline motor driven pump to carry off excess water. If there should be a delay in getting a crew out with a pump, piping and regulators are constructed so that the entire system can operate completely submerged.

LARGE VAULT (Milford)

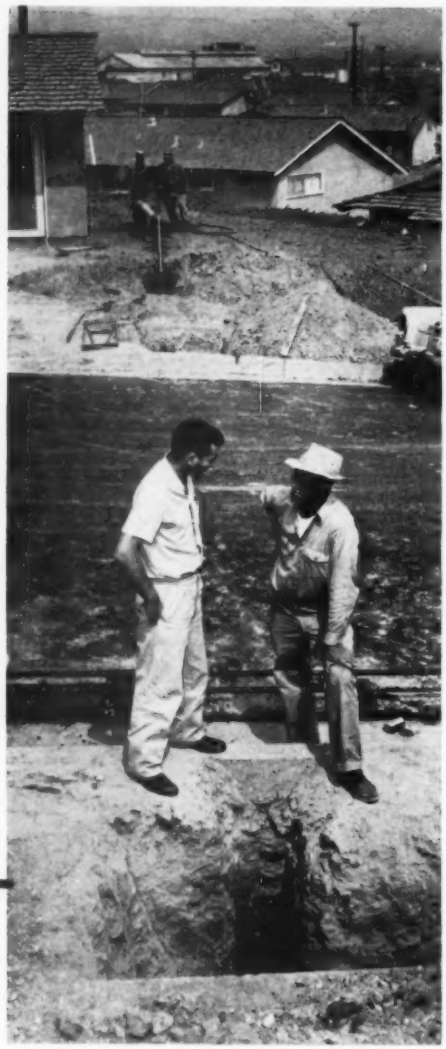
Construction of vault—contractor	$2615
Welder, helper, rig.	130
Labor	1430
Transportation charges	60
2- Type A Bilco doors (special)	546
5- 6″ Weld tees	185
16- 6″ Weldneck flanges	175
6- 6″ Std. weld ells	110
2-12″ Blind flanges	57
2- 4″ 90 deg weld ells	13
2- 6″ 45 deg weld ells	21
2- 6″ Slip-on flanges	17
1- 6″ 90 deg weld ell	13
2- 8″ x 4″ weld reducer	36
36 ft. 6″ steel pipe	70
51 ft. 4″ steel pipe	60
15 ft. 8″ steel pipe	45
2- 8″ x 6″ Insul. couplings	100
Misc. Material and supplies	274
TOTAL	$5957

SMALL VAULT (North Haven)

Construction of vault	$ 306
Labor	210
1- Type A Bilco double leaf door	183
1- 6″ valve	195
Material and misc. charges	235
TOTAL	$1128

Additional drainage is provided by the vault door. Water on the cover drains to the framing channel which, in turn, drains directly to the gutter through a piece of 1½-in. straight pipe which the company installed. It is connected with a tee on the vault end to permit the drainage pipe to be cleaned. The door is flush with the sidewalk, which makes it safe for pedestrian traffic and, when open, furnishes plenty of light and ventilation. It also gives wall-to-wall access to the pit.

The table shows construction costs to New Haven Gas Co. for two varieties of the open-pit sidewalk regulator vaults (exclusive of equipment in the vault). ■



Meeting demands of constantly booming area and inflationary unit costs by

Developing and installing a construction analysis system

By JOHN L. McCOLLUM, Supervisor, Construction Procedures
Southern Counties Gas Co., Los Angeles

Construction foreman Ray Dyer (at left in the above photo) makes quality analysis check with Hood Construction job foreman Tom Hawkins. Dyer will look at elements of construction work in progress. Later he will make out a check sheet on job.

VERY few of us like to change our ways of doing things unless we have a good reason. Southern Counties Gas Co. is no exception to this rule. We had two reasons in 1954 for wanting to make extensive changes in our operating procedures: (1) The continual growth of the southern California area; and (2) our unit costs in 1954 were following right along with the inflationary trend due to annual price increases for wages, steel and equipment. This disturbed us because it is normal to expect a progressive company to make an annual improvement which at least in part offsets an inflationary price increase. So here is a rough pair to beat—mushrooming growth on the one hand and rising prices on the other. This is the challenge that most of us in distribution work are faced with today, and this, in turn, is the story of our company's attack on this problem.

• Possible solutions

The answer to a complex problem like this is never clear cut and easy to determine. Many possible solutions have to be weighed by top management before a decision is made. There were many alternates considered. Here are three typical ones:

1. Create more supervisors and hire additional people down the line to try and attain closer control.
2. Keep going the way we are now.
3. Have someone look at our operating procedures and provide tools for our supervisors in the planning area.

Alternate 1 was not chosen because of the obvious increase in operating costs which would result from adding more people and with no guarantee that we wouldn't be right back where we started in a few

years. Alternate 2 looked like a poor gamble because, as already mentioned, cost trends were up and there was no end in sight to the growth problem either. Therefore, alternate 3 looked best as a first step before making any changes. A consultant firm was directed to study our practices, and provide a nucleus around which a planning program could be developed.

Their report revealed that the greatest immediate opportunity for controlling construction and operating costs lay in one general area. This area was in the planning, scheduling, and dispatching of distribution construction work. Using material from past method studies, the report also provided standards that could be used for making time estimates.

• Developing the package

Now that we knew where to start, plans were made for the development of a "construction package" that would enable us to save costs by concentrating on this important area. The first step in putting this package together was to determine just what it had to do for us. Following are the initial things that we wanted from this package:

1. Provide an effective tool to aid operating department supervisors cover their increasing work load due to growth. (Some of our construction and maintenance supervisors were assigned as many as 26 crews in 1955 and 1956.)
2. Furnish a sound basis for evaluating our current construction procedures against revised or entirely new practices that we wanted to try.
3. Provide a simple method to compare job costs between company and contractor cost plus, and contractor firm bid work.
4. Furnish a procedure which would permit, and require, planning early enough so that results could show up in lower job costs when the job was done.
5. Provide a sampling type "quality analysis plan" whose objective would be to assure quality of construction work within acceptable limits.

Taking our own objectives and then following the consultant's recommended area of attention, an initial program was developed around a four-step process. These four steps and our interpretations of them are:

1. *Planning*—means deciding where the work is to be done and how the work is to be done.
2. *Scheduling*—means when the work will be done and who is to do the work.
3. *Dispatching*—means execution of the plans and schedules, release of orders to crews.
4. *Summary*—after the job is over, finding out how we came out.

• What does the package include?

Up to now we have been talking about initial objectives and the four-step planning, scheduling, dispatching and summary process around which the program was built. Let's get down to detail now and

SAMPLE JOB TIME ESTIMATE

Description:

500' of 2" wrapped main and 3 services - 290' of 3/4"
Medium soil - 10 miles travel
Paving - 6" asphalt over tie in only - no curbs
Installation method - machine trench
Backfill method - machine
Compaction method - flood and roll

Operation	Man-Hours
Locate and lay out	2.4
Break paving and temporary repair	.9
Excavate main and services	8.2
Pipe preparation	18.4
Main installation	4.2
Construct services	13.3
Pressure handling and purge (includes one PCF)	4.1
Backfill and compact	6.5
Equipment on and off	2.8
Crew on and off plus travel	4.3
"ET" =	65.1 MH

Adjust "ET" for Dispatch

1. Foreman's ET/AT = .70
2. "ET" for job = 65.1 man-hours
3. $\frac{65.1}{.70}$ Man-hours = 93 man-hours (use for scheduling and dispatching)

Fig. 1. Sample job time estimate.

BACKLOG REPORT

Division ORANGE CO. Date 10 APRIL 1959

	No. of Jobs	Short Range Within 60 Days	Long Range Beyond 60 Days	Crew Days To Bid
I. Work to Plan				
Area SOUTH				
a. Main Extensions	15	12	16	
b. Tracts	14	41	32	
c. Replacements	3	34		
d. Distribution				
e. Jobs to Bid	2			20
Area NORTH				
a. Main Extensions	5	5	2	
b. Tracts	18	32	51	
c. Replacements	1	2		
d. Distribution	1	6		
e. Jobs to Bid	2			71
Total Work to Plan	61	132	104	91
II. Work to Schedule				
Area SOUTH				
a. Main Extensions	10	15		
b. Tracts	4	20	3	
c. Replacements	21	139		113
d. Distribution				
e. Jobs to Bid				
Area NORTH				
a. Main Extensions				
b. Tracts	5	25	3	
c. Replacements	7	45		78
d. Distribution				
e. Jobs to Bid	1			24
Total Work to Schedule	48	238	8	215
III. Work Dispatched				
a. To Company Crews	10	26		
b. To Contractor Crews	26	160		
Total Work Dispached	36	186		
IV. Total Backlog	145	556	112	306

Summary Short Range Backlog

I.	Work to Plan	132
II.	Work to Schedule	238
III.	Work Dispatched	186

Total crews available 12 (Company 4 Contractor 8)
Total number of crew days work/crew in short range backlog 46.
ET/AT used .70.

Fig. 2. Backlog report.

see just what the program includes. The program actually has two main parts. Planning, scheduling, and dispatching are one part, and the job sampling plan which we call "quality analysis" is the other part. Let's take them one at a time and see what each part is all about. The planning, scheduling and dispatching part of the program follows these lines:

The entire backlog of construction work is kept at one point in the division and divided into three categories: "work to plan," "work to schedule," and "work dispatched." Simple job time estimates are made on each construction job, including the related service work. (See *Fig. 1.*) This permits us to measure our backlog of work in crew days. (See *Fig. 2.*) It also assists in maintaining schedules and in keeping the number of available crews balanced with the amount of work on hand. There are also routine procedures which require planning and scheduling decisions by the supervisor at each of the three stages that all the jobs go through. When the job is completed in the field, the accounting department summarizes the job for us to see how we did. They accomplish this by comparing the "ET" (estimated time) for the job with the "AT" (actual time) required to complete the job. These results determine our future actions in the planning and scheduling stage. (See *Fig.* 3.)

The "quality analysis" part is set in motion by the supervisor as he makes his routine job visits. He completes a simple checkoff form on each crew he visits during the day on which he looks, rates, and reports on those parts of the job that are in progress at the time of his visit. In addition to these observations, the supervisor also initiates objective tests of the protective coating and welds when conditions permit. Each month the accounting department recaps those reports by machine and sends the results to the operating department. (See *Fig. 4.*)

With this two-part program, we felt we had an effective tool to evaluate methods, procedures, equipment, and to control costs and quality. Short pilot runs of each of the two parts were completed in two large divisions; one division pioneered the quality program, the other the planning, scheduling and dispatching operations. After these trial runs, final changes were made to complete the package.

• Installation of the package

Now that a program is developed, how do we go about putting it in effect? Should we just mail it out to the divisions and tell them to start the first of the month? This would be nice, but we all know how far we would get with that approach.

A very important part in the success of the program, or any program for that matter, is the way it is presented. To stress the importance of the program and top management's vital concern in it, our vice president, superintendent of operation, and manager, construction, made the presentation of the program at dinner meetings in each of the eight operating divisions. The meetings were arranged by the division managers who, in turn, introduced the three speakers. These meetings were attended by all the interested supervisors and crew leaders, both supervisory and union subject.

The general aspects of the program and the reasons for it were outlined by each of the speakers. Questions were encouraged from the group. Visual aids in the form of flip charts were used by all three speakers to further illustrate the information presented. Because the program involves the use of time standards, great emphasis was placed on the fact that the standards, in the case of company crews, would be used only to measure our own planning effectiveness and for scheduling. This was one big point we were trying to make to our own people, that standards are more a measure of the planning step rather than a measure of how the execution step turns out. This conception of planning is hard to live with because it is always easier for us to blame someone else when a job goes sour.

At this time (early 1955) about 80 per cent of our

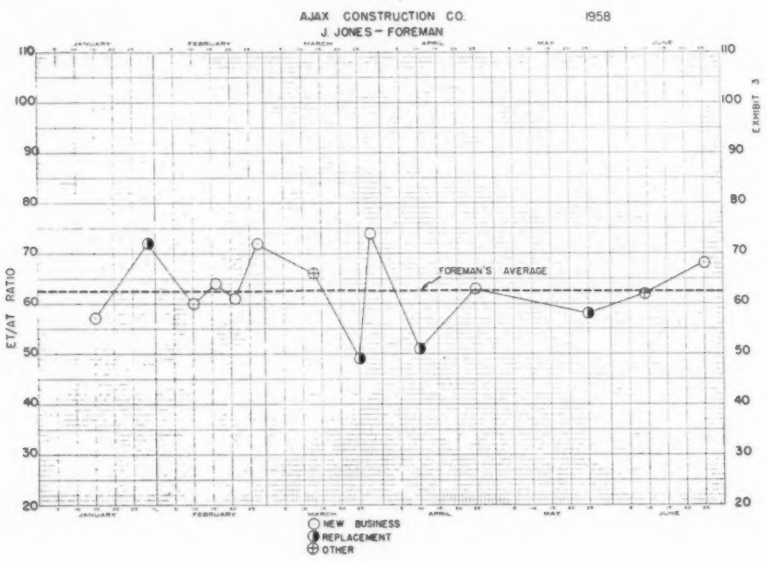


Fig. 3. Comparison of estimated time with actual time.

construction dollar was in contract crew operations. Because we wanted to start where the most money was, and thereby the best opportunity to cut costs, it was decided to install the program in the division doing the largest volume of contractor work. The entire program was installed in this division, except the cost summary step for the company crews; this was omitted to save time so that all the contractor work could be covered first. This same pattern was followed in the other three large divisions. The cost summary step for company crews was added on a second trip.

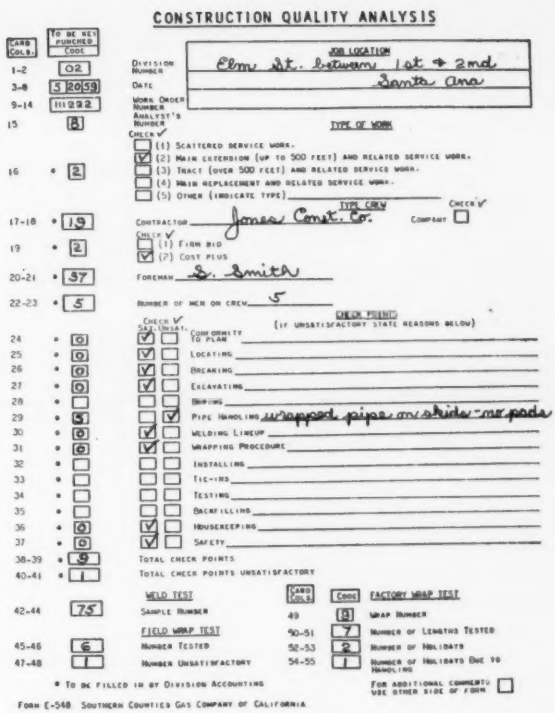
The installation team was composed of two staff supervisors who were responsible to the manager, construction, for the actual installation in the divisions. One supervisor concerned himself with the installation of the planning, scheduling, and dispatching procedures, and the other supervisor worked on the quality analysis installations. The people in the division with whom this installation team was to work were the highest level supervisors under the division superintendent. In the large divisions this consisted of two construction and maintenance supervisors, and one distribution supervisor. The construction and maintenance supervisors are responsible for all the construction and maintenance work in their particular half of the division. The distribution supervisor is responsible for the distribution supply over the entire division and also relocations of our facilities caused by outside agencies.

One of the first tasks of the installation team was to enumerate and examine all the various and assorted jobs that these supervisors performed in a week. This was to make sure that there was room for our program and also to weed out any tasks that the supervisors were doing which the program would make unnecessary. An example of this was in the contractor crews' daily work report which had to be verified by a supervisor before being processed for payment. This requirement was eliminated because the cost summary step of the program would provide the control to indicate whether the contractor's charges were in line or not.

Other miscellaneous tasks were found which over the years had crept into the supervisor's schedule, usually through no fault of his own, and which kept him tied to his desk for more time than he was in the field. These issues were met one by one and the supervisor was relieved of as many clerical and office tasks as possible. You may wonder at the reaction we received from supervisors of this level in checking each and every chore they perform in a week's time. In just about every instance they were glad to have someone see just how much they were doing. This was also a pretty good indication that they were all busy.

The general procedure the installation team followed was to accompany the supervisor as he went about his job. As he made his routine job visits, he was instructed in the quality sampling techniques. This required the equivalent of about only one week with each supervisor because the only real change involved was for them to record the observations they made.

The planning, scheduling, and dispatching part involved training meetings and more individual discussions in the office. The time estimates, backlog reports, order filing, and processing duties are all performed by clerical personnel. However, the supervisors had to be thoroughly familiar with all these procedures because they are responsible for it all through these stages. They were instructed in the use of the "ET" or estimated time which is made on each job in the backlog. This "ET" enables them to estimate crew time required for the job, or estimated cost of the job.


CONSTRUCTION QUALITY ANALYSIS

JOB LOCATION: Elm St. between 1st & 2nd
DIVISION NUMBER: 02
DATE: 5 20 59
WORK ORDER NUMBER: 111222
ANALYST'S NUMBER: 8
TYPE OF WORK
(1) SCATTERED SERVICE WORK.
(2) MAIN EXTENSION (UP TO 500 FEET) AND RELATED SERVICE WORK.
(3) TRACT (OVER 500 FEET) AND RELATED SERVICE WORK.
(4) MAIN REPLACEMENT AND RELATED SERVICE WORK.
(5) OTHER (INDICATE TYPE)
CONTRACTOR: Jones Const. Co. — TYPE CREW — COMPANY
(1) FIRM BID
(2) COST PLUS
FOREMAN: S. Smith
NUMBER OF MEN ON CREW: 5

CARD COLS.	TO BE KEY PUNCHED CODE	CHECK ✓ SAT.	UNSAT.	CHECK POINT (IF UNSATISFACTORY STATE REASONS BELOW)
24	0	☑	☐	CONFORMITY TO PLAN
25	0	☑	☐	LOCATING
26	0	☑	☐	BREAKING
27	0	☑	☐	EXCAVATING
28		☐	☐	SHORING
29	5	☐	☑	PIPE HANDLING wrapped pipe on skids - mr poda
30	0	☑	☐	WELDING LINEUP
31	0	☑	☐	WRAPPING PROCEDURE
32		☐	☐	INSTALLING
33		☐	☐	TIE-INS
34		☐	☐	TESTING
35		☐	☐	BACKFILLING
36	0	☑	☐	HOUSEKEEPING
37	0	☑	☐	SAFETY
38-39	9	TOTAL CHECK POINTS		
40-41	1	TOTAL CHECK POINTS UNSATISFACTORY		

	CARD COLS.	CODE	
WELD TEST SAMPLE NUMBER	42-44	75	
FIELD WRAP TEST NUMBER TESTED	45-46	6	
FIELD WRAP TEST NUMBER UNSATISFACTORY	47-48		
FACTORY WRAP TEST WRAP NUMBER	49	8	
NUMBER OF LENGTHS TESTED	50-51	7	
NUMBER OF HOLIDAYS	52-53	2	
NUMBER OF HOLIDAYS DUE TO HANDLING	54-55	1	

* TO BE FILLED IN BY DIVISION ACCOUNTING
FOR ADDITIONAL COMMENTS USE OTHER SIDE OF FORM ☐
FORM E-548 SOUTHERN COUNTIES GAS COMPANY OF CALIFORNIA

Fig. 4. Construction quality analysis.

You are probably thinking right about now that all this is falling into place pretty well. Didn't we have any problems?

We had our share all right. The problems were usually unforeseen when we started, but had to be reckoned with as we went along. Although we could not afford to compromise any of the main objectives, some of the minor procedures which did not work out were modified or even abandoned. As to other complications, imagine trying to enthuse a construction and maintenance supervisor about a new program while at the same time he is trying to keep track of 26 crews! Sometimes the work took longer than we had planned; at other times the installation took less time than we thought it would.

The complete installation in the eight operating divisions covered a period of two years. This involved two visits of approximately two months apiece to each of the four large divisions and about one month at each of the smaller ones. Something should be mentioned here about the value the installation team derives from a project like this—it certainly affords an opportunity to become thoroughly familiar with each division's operations and its individual problems.

SoCounties plans for the future in this extension to a new subdivision. Installation will not be used to capacity, but is designed for expected future growth of area. Job entailed boring under railroad tracks, inserting 8-in. casing.

They are then in a better position to serve the divisions in their normal staff functions.

• Conclusions

You are probably wondering at this point what have been the results of this program. After nearly three years' experience with our program, we can report that our initial objectives have been attained. The type of planning and reporting procedures that we now have permits our supervisors to cover more ground and do a better job at the same time. Our unit costs have *not* continued to follow the inflationary spiral that they did previously. The difference in our unit costs between 1954 and today amount to over $2 million a year less in overall construction costs than if they had followed the same trend. Can we say this is directly attributable to our construction program? No, not all of it. There have been other areas of improvement and other factors which contributed to this savings, but a large portion can be attributed to it as a direct result and additional savings as an indirect result.

One suspicion we had, and which is confirmed by the summary steps, was that there is a lot of truth in the old adage, "If your planning is good—control is no problem." Having a sound basis for measuring contractor crew performance has permitted us to put the cost plus contractor more or less on his own. He must live with his own cost record in a highly competitive atmosphere. This results in the contractor policing his own problems and striving to improve performance to maintain his share of cost plus work. When a shortage of work develops, the contractor with the poorest cost performance is the one that loses the crew. This has automatically resulted in increased production in our contractor cost plus work force after three years of normal crew adjustments. Our supervisor does not have to concern himself about the way the contractor uses equipment and manpower; his concern is in the end result. As for our own company crews, we make the assumption that each employee wants to do a good job. Therefore, management must first point out what constitutes a good job and then provide the tools, methods, and equipment to enable the employee to achieve this. Our construction analysis package enables us to evaluate our own planning and to test the effect of new procedures or equipment on our own jobs.

At the present time we are refining our estimating procedures to take into consideration new equipment and job methods which have been added since the start of the program. These estimates are not being polished just for the sake of more detail, but to take into consideration the ways of doing the work. Our original standards were rather rough, but we have found that even "rough" standards are better than none at all. Our next effort is the development of a program for the planning, scheduling and dispatching of maintenance and meter work performed by our two- and three-man crews. We hope that some day we can relate to you the fact that it was as successful as we feel this program was. ■

This article is adapted from a talk presented at the PCGA distribution conference held in Santa Barbara, May 5-6.

A GUIDE TO TRAINING SERVICEMEN— 5

Good customer relations is good public relations, and Metropolitan's PR man Harold E. Roll (with drawing) served as guest instructor at serviceman's school. Field foreman Bud Mair is fifth from left.

Gas incinerators . . . and people

By ROBERT W. BELL, Assistant Superintendent, Mechanical Services
Metropolitan Utilities District, Omaha

THE Metropolitan Utilities District, a combination gas and water utility, serves more than 84,000 customers with natural gas and over 78,000 with water. It is divided into seven departments, our ultimate success depending upon close cooperation among them.

Training servicemen to service gas-fired incinerators is a function of our mechanical service division, which is a part of our gas operations department. This division installs and changes periodic meters, delivers and installs appliances, inspects new heating installations and periodically inspects consumers' premises for leaks. It also provides free adjustment of all gas appliances and equipment. No charge is made for in-warranty parts replacement on appliances sold by the company. Service on air conditioners, other than normal pilot and main burner adjustment offered free to house heating customers, is performed under an annual service contract available for a nominal fee. All other service work, including connection and installation of appliances, is done either on a flat charge or time-and-material basis.

A few years back, to build greater customer satisfaction and more sales, we began a program to in-

GAS exclusive

GENERAL TRAINING PROGRAM

I. Basic Instruction—five days.
- A. Orientation — explanation of course to be followed.
- B. Availability and constituents of gas.
  1. Transmission
  2. Distribution
  3. Chemistry of combustion
- C. Film—The Miracle Flame.
- D. First aid—general.
- E. Safety.
  1. Industrial
  2. Vehicle
  3. Gas industry
- F. Gas burners.
  1. General for all equipment
  2. Pilot burners—general
- G. Related fundamentals.
  1. Basic electricity (film and lecture)
  2. Draft (principles, effect on combustion, control)
  3. Controls—general
     a. Operating safety
     b. Limiting devices
     c. Pressure and temperature
     d. Gas-pressure regulators
  4. Test Instruments — millivoltmeters, milliammeters, pyrometers and combustion analysis instruments
- H. Gas ranges.
  1. Burners and pilots
  2. Oven controls
  3. Practical work by men
- I. Water heaters.
  1. Burners and pilots
  2. Limiting devices
  3. Size requirements
  4. Practical work
- J. Incinerators.
  1. Installation practices
  2. Draft problems
  3. Operation and maintenance
  4. Practical work
- K. Dryers.
  1. Burners and pilots
  2. Electrical circuits
  3. Installation and venting
  4. Capacity and operation
  5. Practical work
- L. Space heating equipment.
  1. Systems and types of equipment
  2. Proper installations and venting
  3. Controls
  4. Practical work
- M. Refrigerators.
  1. Principles of system
  2. Burners and adjustment
  3. Thermostats
  4. Ice-maker unit
  5. Installation and operation
  6. Practical work
- N. Leak detection.
  1. Explosive limits and characteristics of gases
  2. Handling situations
  3. Use of machines
  4. Practical work
- O. Rules and regulations.
  1. Company policies
  2. Company rules and regulations
  3. Local and state codes
  4. National approvals
  5. Film—"Winning Seals of Approval"
- P. Public relations.
  1. Personal appearance
  2. Proper approaches
  3. Handling situations
  4. Follow-up reports
- Q. Tour of facilities.
- R. Review and written examination.

II. Field training.
- A. Rotating assignments with various men on all types of work (available as helper on jobs requiring two men).
- B. Seventeen weeks' specific assignment on various appliances before going out alone.
- C. Trial periods during seasonal peak vacations and when regular men are ill.

III. Regular courses.
- A. Refreshers (scheduled prior to seasonal peak of each appliance concerned).
- B. New methods, appliances or controls.
  1. By company personnel as needed
  2. By factory service engineer (controls and appliances at least once a year)
- C. Special classes—When report by foremen or analysis of orders shows any weakness.

crease quality of our service. We have made great strides toward attaining this goal. But we feel it is a goal which, though we must continually pursue it, we can never reach.

"People" is the key word in our servicing—both the people we must serve, and people we use to serve them. In general we can credit our successful operations in keeping pace with the rapidly advancing gas industry to five inter-related factors. They are:

1. Selection. Our success in training people to become good servicemen depends upon the type of personnel we have to work with. Our industrial relations department is responsible for sending us people basically qualified and capable of being trained as servicemen. This is done by careful screening and a detailed testing program.

2. Training. We have found it impossible to actually complete training a man. This is a never-ending task which requires a school of some sort during about nine months of the year. Except for a few special sessions, our basic school has from two to seven men in a class. This allows instruction to become individual. Most of our men spend a minimum of two years as a helper, during which time they are under instruction.

3. Equipment. The best-selected, most-trained people in the world cannot be successful unless they have the proper equipment. Equipment for our servicemen includes proper instruments for analysis of appliances they must work on. All of our men carry at least one test meter of some type. Most of them are equipped with a leak detecting device.

4. Analysis and supervision. For purposes of discussion, we can break up our analysis into "Costs" and "Accomplishment." Cost studies are made possible by periodic reports received from our accounting department. Detailed costs are available from our "Responsibility Accounting" system. The accomplishment part of our study is obtainable from continued observation of supervisors and periodic time studies made with the cooperation of a utilization engineer. Pre-scanning orders and bringing chronic calls to the

attention of a man's foreman are invaluable in reducing costly call-backs. When one of our field foremen feels that a man is in need of training, he may give this man's name to the foreman in charge of the school. He will see that the man receives proper instruction.

5. Public relations. Here, success depends upon the success of every department in our company. Although a serviceman might be the first physical contact a customer has with our company, he is usually not the first oral contact. The clerk who took the order on the phone either paved the way for this serviceman or built a barricade between serviceman and customer.

These factors are so inter-related that it is impossible to discuss the one we are primarily concerned with—training—without mentioning the others.

Gas incinerators have not been given too much attention in the past because they are a relatively new appliance. At one time incinerators were considered luxury appliances in this push-button world. However, with sales departments realizing the importance of the load from this appliance, and with increasing concern about air pollution, the gas incinerator is fast finding its place in many homes.

We in the field of service are fortunate that we do not have to develop an entire training program for the successful servicing of gas-fired incinerators. In reality, if our training course on all other appliances has been successful, our men will be ready to service gas incinerators with a minimum amount of additional training. Actually, additional training should merely place special emphasis on certain subjects.

Outlines of the general training program and the incinerator program appear in accompanying boxes.

Controls on an incinerator are few and simple. If our men understand how to service other appliances, they need only a brief review on incinerator controls.

We find that draft is a subject which merits attention in training men to service gas incinerators. Although our basic course covers draft, a review is well worthwhile. We find that improper draft is the cause of many of our complaints on incinerators. We also find that draft is too often assumed as something that exists! Having made such an assumption, a number of men do not have a good understanding of draft. In reality, it is more important that they have this understanding when working on incinerators than on any other appliance. This is due, of course, to the great variation in firing rate and temperatures that are encountered.

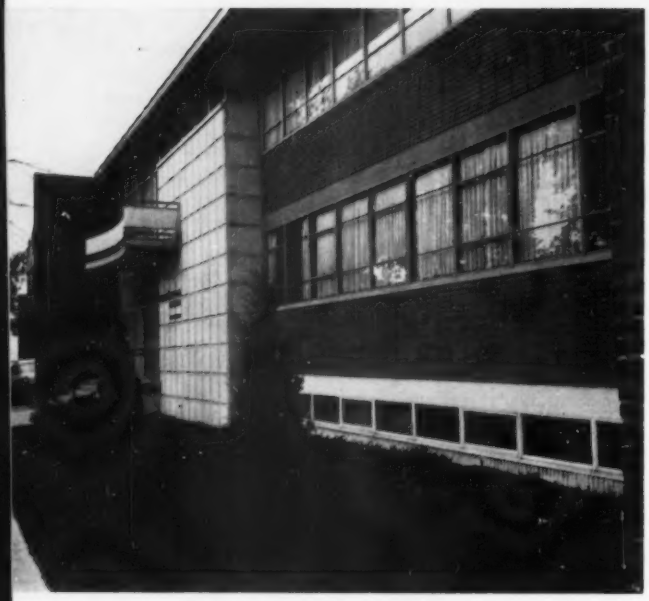
The majority of our complaints on gas-fired incinerators can be laid to improper charging and lack of maintenance. Here, the success of our servicemen is not dependent upon their ability to remove ashes, and clean the pilot and relight it. Rather it is upon their ability to instruct customers to use their incinerators properly. The man's ability to give a satisfactory explanation without irritating the customer requires diplomacy. The serviceman is dealing with people in all walks of life—the housewife, the engineer, the sales clerk—each of whom requires a little different explanation to understand proper functioning and use of an incinerator.

In all of our courses we give our men a test. We keep individual records on each man for consideration when promotions are available. However, in the field of servicing gas incinerators, we find the real test of success of training is in the field. No better measure of success of your public relations training can be found than in a serviceman's ability to cope with a customer who does not properly use or maintain his gas-fired incinerator.

Therefore, we are back to our key word, "People." Our ultimate success depends upon their satisfaction, and their satisfaction depends largely on our ability to train other people to get along with them. ■

INCINERATOR PROGRAM

I. Installations.
- A. Locations.
  - 1. Rules and regulations of company
  - 2. Local building and fire codes
  - 3. Proper clearances
  - 4. Proper gas line connection
- B. Venting.
  - 1. Basic principles of draft—definition and explanation
  - 2. Connection to flues of proper material and size
  - 3. Length of flue permitted
  - 4. Installation of draft control
    - a. Barometrics
    - b. Dampers
- C. Adjustment.
  - 1. Burner and pilot
  - 2. Draft control
  - 3. Timer
  - 4. Pressure regulator
- D. Proper operation.
  - 1. Types of material to burn
  - 2. Method of charging
  - 3. Quantity of material to be burned
  - 4. Timer operation
  - 5. Ash removal and shaking
- E. Instructing the customer.
  - 1. How to wrap wet waste
  - 2. Mixing loads
  - 3. Proper operation as outlined in paragraph "D"
- F. Customer relations.
  - 1. Proper approach
  - 2. Handling situations
  - 3. Explanations
- G. Examination.



Administrative offices, Denver.

Operating

By LEE E. SCHLESSMAN
Vice President, General Operating Procedures
Greeley Gas Co., Denver

GREELEY Gas Co. is a widespread natural gas distribution company of modest size, operating in the individualistic middle Rocky Mountain West.

With just under 22,000 meter customers in its entire system in Colorado and Kansas, Greeley Gas is big enough to have problems similar to those of much larger utilities. Yet it is small enough to present some problems seldom met by the Goliaths.

On what basis does such a company operate? What are its solutions to day-to-day problems? Does it have unusual troubles in financing funds necessary for system expansion? How does it anticipate growth of its service areas and future requirements of its natural gas supply?

True, the questions are much the same as those faced by giant gas distribution outfits. But the answers are somewhat different.

Over the years, Greeley Gas Co. has succeeded in rising out of the "small" category in many respects—particularly in the areas of management, philosophy of conducting business, maintenance of its physical plant, and expansion of its services.

Canon City's customer service building.

Bonner City center opened in June.

A profile of Greeley Gas Company

the small but growing utility

And HOMER S. LANNING
Vice President and Treasurer
Greeley Gas Co., Denver

GAS exclusive

Its financial picture has shared this maturity. The company's 1958 annual report shows operating revenue from gas sales for the year was $2,893,575—an increase of $807,950 over 1957. And, net profit rose some 40 per cent, from $82,956 to $116,620. Nearly 1000 new customers were gained during 1958.

Completing the portrait, Greeley Gas is a series of five inter-related operating Districts, employing a total of some 125 people. It makes a number of rather notable contributions to the communities served.

General administrative offices for the system are in Denver. There, the president and several other key officers make their headquarters.

• More than a half-century old

History of Greeley Gas Co. dates back well over 50 years—to 1902, when the company was established in Greeley, Colo.—then as now, the fourth largest city in the state. (With a present population hovering around 30,000, Greeley is the metropolis of agriculturally rich Weld county.)

During early years, the company experienced only a few changes in controlling interests. It eventually became known as Greeley Gas & Fuel Co. Initially, the utility distributed manufactured gas—largely for street and home lighting—until natural gas was piped in from the Texas Panhandle in 1930.

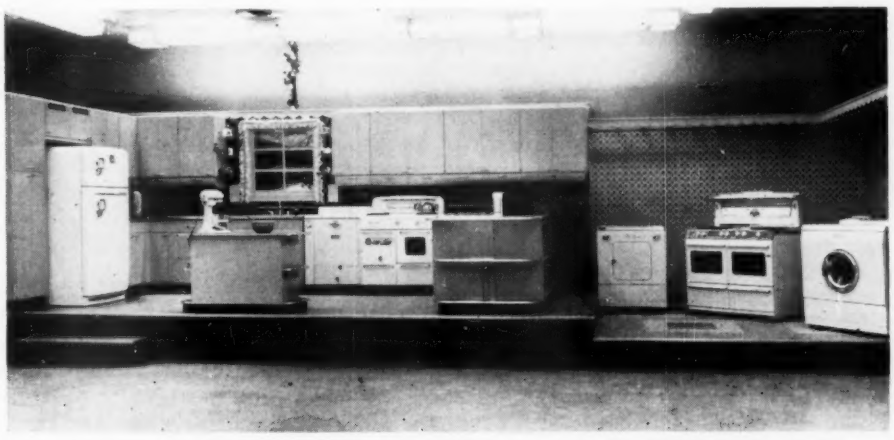
By 1943, growth had been slow indeed. Owner-management at that time was located in the East. Total gas sales for 1943 were only $166,059, and the average number of customers in Greeley was a scant 2528.

In 1944 the present owner, Gerald L. Schlessman, purchased the Greeley property. He acquired all outstanding stock and continued operation under the original name, Greeley Gas Co.

An extensive program of repair and replacement was launched at once. In the 15 years since, the company has gradually expanded its service to 12 other, smaller communities in Weld county. The end of 1958 saw 9649 customers being served in that county alone.

But this is only a fragment of the utility's progress story during the last decade and a half.

Blue Flame room in Greeley.



In 1951, Greeley Gas bought the natural gas system in Craig, a town of about 3100 then, located in rolling wheat, livestock and mineral land of northwestern Colorado. The district has grown steadily and now totals some 1400 meters.

In its next expansion move, only four years later, the company took over ownership of the system serving thriving Canon City and environs, a district boasting just a few meters short of 3200 at the end of 1958.

The firm's most recent acquisition—and the largest since Schlessman purchased the original Greeley property—was the Kansas assets of the Central West Utility Co. in December 1957. This system added roughly 6900 meters to the Greeley Gas total. It has two operating districts. One, the Kaw Valley district in eastern Kansas is headquartered in Bonner Springs. The other, the Central Kansas district, is in Herington. Each serves numerous farm-based communities. As 1958 ended, the combined number of customers was about 7050.

Today, each of Greeley Gas Co.'s five districts is headed by a district manager. Every manager is a practically autonomous local executive who, in effect, operates his own utility.

• All business is local

The philosophy behind decentralization is a simple one, yet it has proved sound in actual practice.

Top management of Greeley Gas believes that the operation of its distribution system works best when based on a maximum delegation of authority to local management.

Generally speaking, the five district managers are fully responsible for running their part of the system. They follow broad, basic policies, of course, but there is a minimum of "remote control" restrictions which require a manager to refer decisions to higher management levels. The company is firmly convinced that this makes more effective men of its managers. Also, these local executives in turn gain greater respect from their employees and the community with which they are associated.

Each district manager is charged with hiring, training, advancing and supervising people working under him. He is a veritable fountainhead for all the answers demanded of him as an administrator. He refers to the "home office" only those problems which require a basic policy decision. Thus, employee-management relations are complete at the district level.

To further localize the company's operations, customer cycle billing has been decentralized. All customer bills are prepared in, and mailed from, district offices. Each is responsible for the entire billing procedure, including collections and adjustments.

Control of materials and supplies is also handled at the district level. Clearly, each district is virtually self-sufficient; yet, each faithfully reflects uniform standards set by one administrative policy.

Interestingly enough, the work-flow moves from district to administrative office, unlike many companies where the reverse is true. As a result, the Denver headquarters functions primarily to *coordinate* rather than *direct* operations at the distribution point. Free interchange of ideas and methods consequently serves to unify the quality of gas service throughout the system.

There is no question in the minds of Greeley Gas management that this free-swinging efficiency produces a brand of service to customers that is on a very high level of excellence.

• The good-neighbor policy

Greeley Gas Co. decided long ago that there was more to its business than merely delivering natural

Natural Gas Sales 1956-1958—Gas Pipeline Suppliers

SALES

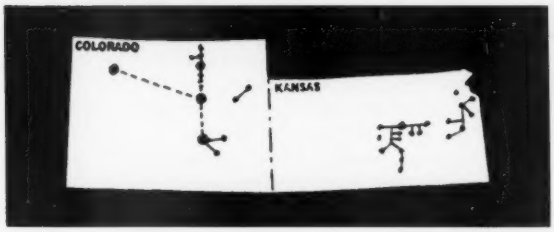
	1956		1957		1958	
	MCF	$	MCF	$	MCF	$
Colorado:						
Greeley	2,130,037	1,251,858.93	2,289,512	1,388,004.83	2,241,548	1,469,232.30
Craig	530,092	159,223.32	534,922	167,052.59	550,477	169,621.73
Canon City	1,043,581	427,559.63	1,086,389	471,782.65	960,767	475,019.36
	3,703,710	1,838,641.88	3,910,823	2,026,840.07	3,752,792	2,113,873.39
Kansas*						
Bonner Springs	.....	.....	15,316	8,707.58	467,784	264,249.10
Herington	.....	.....	109,923	50,076.97	1,152,079	515,452.45
			125,239	58,784.55	1,619,863	779,701.55
			4,036,062	2,085,624.62	5,372,655	2,893,574.94

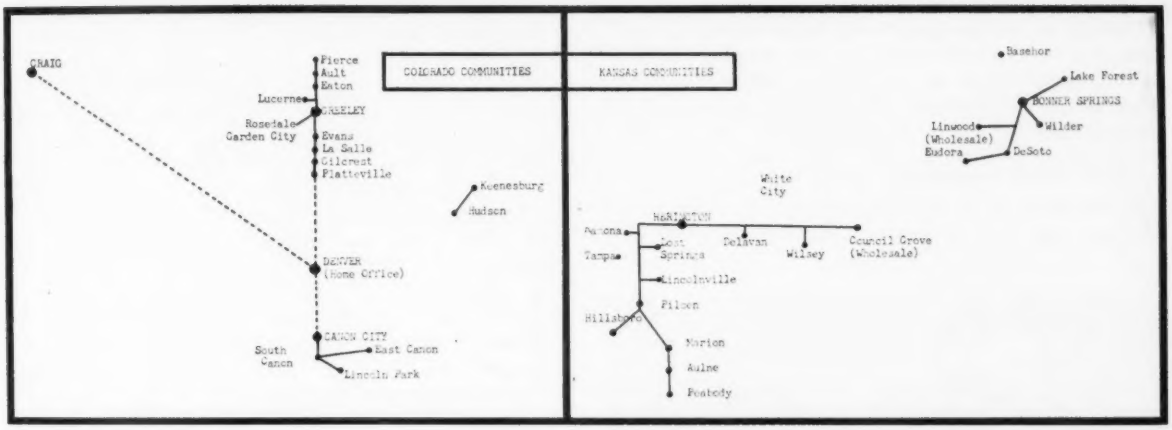
*Kansas Operations were purchased on December 4, 1957.

Gas Suppliers
Colorado-Wyoming Gas Company
Colorado Interstate Gas Company
Continental Oil Company and Sinclair Oil Company
Kansas Power and Light Company

Cities Service Gas Company

Division Supplied
Greeley
Canon City
Craig
Herington
Council Grove—Wholesale
Bonner Springs
Linwood—Wholesale





gas through a pipe and collecting money.

It feels a kind of moral obligation to contribute something to the community, and not just wrest a profit from the populace. It's definitely a "two-way street" proposition. There are numerous facets of the company's operation which mirror this philosophy of management. They have aided materially in smoothing the way to success.

One is maintenance of its physical properties—its offices, shops, underground facilities and rolling stock. Greeley Gas is "modern" in all these respects. It realizes that a continuous program of expansion, updating and replacements is mandatory if it is to *stay* modern. During the past three years, distinctive new customer service and sales buildings have been constructed in two districts. Office quarters have undergone extensive remodeling and redecoration in others. Public open house activities were staged in each instance.

The more direct approach to community relations has earned for the company an unusually high degree of respect from the townspeople it serves. It is expressed in this way by President Schlessman:

"We think that a utility — which serves nearly everyone—should be a good citizen, a good neighbor and the friend of all the people it works for. This may seem an old-fashioned attitude, or an enlightened one, depending on how you look at it."

In line with this viewpoint, Greeley Gas Co. encourages its individual members to participate actively in community affairs. The company likewise feels that courtesy and safety in operating its many vehicles a total of thousands of miles a day is one of its foremost demonstrations of civic responsibility. Important in this regard are the firm's many safe driving awards which driver-servicemen have received year after year. In 1958, 45 awards were made to such men for their distinguished accident-free records.

A program of institutional advertising, plus regular salvos of informational publicity, has also proved a useful tool in building extremely favorable public acceptance.

• Employees important to progress

Local district managers are noted for "running a good shop."

To do this, they are backed by a management philosophy which goes to considerable lengths to attract and hold the best people available. Since Greeley Gas —like most utility service companies—is closely linked to the welfare of almost every citizen in its communities, being liked and respected is vital to triumphant success. Much of this responsibility must necessarily be entrusted to personnel in their daily contacts. It has worked well.

The company encourages loyalty and cooperative spirit by providing pleasant working conditions, rewarding individuals commensurate with their progress, and offering benefits which improve the security of employees and their families.

A group life insurance and pension retirement program and a medical-hospital insurance plan have been in effect for many years. Additional coverage through a major medical insurance plan was made available to employees in 1957.

To insure development of administrative skills, managers and key assistants attend a week-long management conference sponsored each summer for business executives by the YMCA Conference in bucolic Estes Park, Colo.

Last year, a bi-monthly, inter-company newspaper began publication as a folksy communication tie between districts.

This approach to people has paid off handsomely. Greeley Gas Co.'s record of employee tenure is outstanding. Of the firm's 125 men and women, the average length of service is better than five years. Strong personal identification is felt toward the beautiful service pins awarded at the annual company party. There are 34 persons who have been with the company (or predecessor utilities) 10 years or more.

This is personally gratifying to Schlessman, who observes: "Our people are important to our progress. By and large, most positions of responsibility are filled by promoting from within the ranks of the organization."

• What about financing?

As is true of most business concerns, a utility does not move far forward without adequate financing of

Vespa motor scooters are a recent addition to make meter-readers mobile.

funds to improve and expand its operations. This is often one of the greatest hurdles constantly facing a smaller utility.

What problems does Greeley Gas Co. have in this respect?

Only one, basically—that of the *high cost* of financing. Unfortunately, interest rates are stiffer for small firms, thereby making the expense of financing considerably greater, proportionately, than for large operators.

However, the coin has its brighter side. Greeley Gas has in its president a man with broad experience in the investment field. He understands relative costs of money, has a shrewd sense of timing, and is widely known and liked in financial circles. Such knowledge and contacts have reduced materially difficulties in financing the company's progress—including some of the cost penalties, as well.

The firm's vice president and treasurer, Homer S. Lanning, has also been instrumental in facilitating answers to the age-old money problem.

The capitalization and financing structure is not a complicated one. At present, bonds are held by insurance companies. Preferred stock and debentures are in the hands of private investors. In each instance when stock has been offered to the general public, there has been an oversubscription of the stock. So-called "internal" financing is accomplished through short-term bank loans.

• Service a daily watchword

Service to customers is the watchword of all operations.

Basic policies and liberal intra-district exchange of ideas for improving methods enables Greeley Gas to perform this function on a uniformly high plane. Since the size of the system imposes obvious limitations on opportunities of personnel to specialize, the staff, collectively and individually, is exceedingly versatile.

External service is carried out by well-trained servicemen. They use the most up-to-date tools and equipment. Areas of operation have been set up for "trouble" men, so that calls are placed in special boxes for rapid handling. As an additional expediting measure, and to assure the most efficient use of every serviceman's time, service vehicles are interconnected through a two-way radio dispatch system.

Complete internal service to customers is provided by facilities in the company's modern offices. Here, local-level billing, credit and connection data originate. Here, too, are located appliance sales and service areas.

Through its Blue Flame rooms, Greeley Gas hosts thousands of customers in club groups and community organizations. It furnishes kitchen and meeting room equipment and conveniences at no charge. Symbols of hospitality, these service rooms are also in regular demand for company-conducted cooking, laundry and home economy demonstrations.

Besides serving as hostess-assistants, trained full-time home service directors visit homes of customers with suggestions for the care and greater enjoyment of gas appliances.

• Gas gets constant promotion

Greeley Gas shares, to an unusual degree, the headache of most gas utilities—the aggressive advertising and merchandising procedures used by the chief competitor: the electric utility.

Prior to the past two or three years, it has proved difficult to interest first-class appliance dealers in small towns to push sale of gas appliances. Therefore, we found it necessary to become a very aggressive appliance merchandising utility. (Bookkeeping and accounting is divided between gas sales, piping and merchandising activities.)

The sales staff of every district is headed by a new business manager. These men are in constant touch with local contractors and architects about gas appliances, water heaters and furnaces. Finding many of these influential people not well informed on the latest gas equipment available, Greeley Gas personnel have

taken it upon themselves to do the job. They have also taken the lead in introducing gas-fired equipment to a growing air conditioning market, both domestic and commercial.

The utility has consistently pursued a policy of popularizing the many modern uses of gas through such highly publicizable promotions as sponsorship of Colorado's first all-gas home last year. It has backed another since then, and has in the works plans for sponsoring and promoting at least one such house in every district before the close of 1959.

Gas ranges and dryers got an extra push last year from the company-sponsored "Mrs. Colorado" state winner and entrant in the annual Mrs. America contest.

Nearly every Greeley Gas employee gets into the act, too. About 90 per cent own their own homes, and have installed gas yard lights. The tremendous interest generated in this new product has helped develop new load in all service areas.

By supporting all sales efforts with a regular schedule of newspaper and radio advertising, closely coordinated with national promotion activities of AGA, Greeley Gas enjoys a significant measure of success in building gas load via new gas appliances. The company also supports AGA's PAR program.

• Full-scale advertising program

Greeley Gas Co. believes that next to its people, who are the most important part of an organization in establishing and maintaining a warm relationship with each community, the second most powerful force is advertising.

Because it must strengthen the bond between company and customers, this advertising must get across feelings of friendliness, helpfulness, progress, fairness, service, human interest and community betterment. It must make people "feel good" about gas.

The company's advertising is divided into four main types:

(1) Appliance promotion is designed to sell specific merchandise at a specific price. Or, it may talk more about general benefits of gas derived from modern appliances than about any particular brand.

(2) Gas product promotion keeps customers happy and enthusiastic about their natural gas service — especially in home heating, which covers nearly everyone. Its job is to foster the attitude that gas is a great service; that it has real value, and is worth every penny shown on the monthly billing!

(3) Reminding customers of the promptness and efficiency of the company's *gas service* builds good will, by offering important information that leads to greater long-range satisfaction.

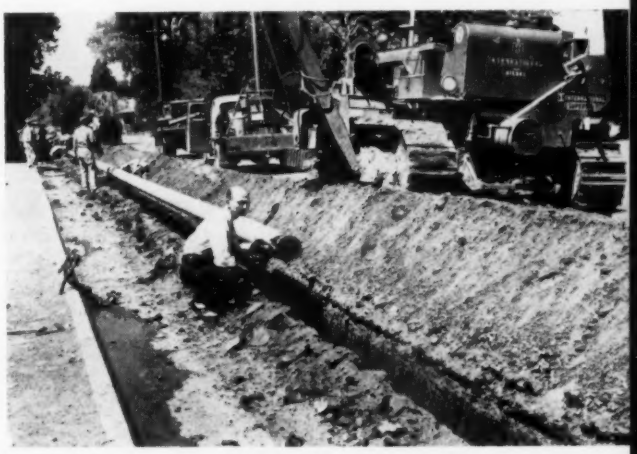
(4) Institutional messages speak out in behalf of improving the community or in support of the higher ideals of Americanism and Christian Living. These appear regularly on such occasions as Christmas, Easter, Independence Day, income tax time and election day. While the company freely admits that these themes do not "sell" Greeley Gas service or merchandise, it believes firmly that they do establish the utility in a position of prestige and respect as a solid citizen helping preserve a high standard of living in the communities it serves.

Approximately half of the company's advertising is devoted to the last three subject classifications.

Has this whole program been worthwhile?

Certainly, say the Greeley company officials. Carefully planned advertising has helped them build greater and more uniform load through more year 'round use of gas appliances. There is also income from the direct sale of appliances themselves. And customers feel they are getting superior service. What's more, by keeping the customers informed—such as in suggesting what to do with their heating equipment in spring and fall, the work schedule of district service departments is substantially eased.

There seems to be no doubt that this philosophy has stood the company in good stead with the community over the long haul. It has had its effect on how the public feels about rate increases, service expansion and the renewal of company franchises.



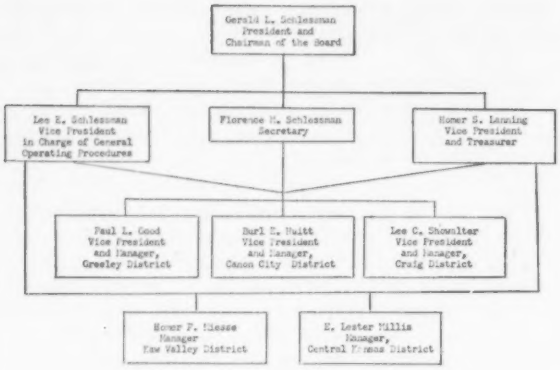
Construction crews laying mainlines.

Lee E. Schlessman, vice president of general operating procedures, has this to report: "We have found that in towns where this kind of advertising plan is a strong part of a utility's operations, there is a very high level of service satisfaction and community acceptance of both gas and the company itself. In the matter of rate pass-ons, for example, there is a minimum of grumbling heard and never any real opposition."

All of the company's advertising, publicity and collateral material is prepared by Galen E. Broyles Co., Inc., Denver advertising agency. Having served Greeley Gas for more than 10 years, the Broyles organization is practically "one of the family," and handles all details involved in creating and co-ordinating an effective program.

• What lies ahead?

The future of Greeley Gas can perhaps best be



Organization chart of Greeley Gas Co.

projected from its past record. Executives are optimistic, certain that a realistic outlook is one showing even greater fulfillment of the system's potential.

All the indications are there—in the healthy economic development of the five operations districts. The company continues to plan aggressive expansion in each, making sizable investments, in order to keep ahead of the demands of steadily growing populations. Moreover, a greater per meter use of natural gas is promised by the general increase in gas appliance and equipment installations.

As the gas sales curve wends its way pleasantly upward, company management feels justified in expecting the sustained rise in net profits to continue also. It's a comfortable trend, but one that is not without moments of nagging uneasiness.

On one hand, since all its properties are connected to ample natural gas reserves through established pipeline suppliers, Greeley Gas foresees no problem in getting all the gas it needs.

On the other hand, however, it does anticipate further difficulty involving the *cost* of the gas it buys.

This is hardly surprising, since negotiations to make rates stand still have been going on continuously on the part of everyone in the natural gas business—from the field to the distribution outlet. The problem of stabilizing the cost of natural gas at the consumer level is common to utilities throughout the nation.

Taxes and the inevitable rises in operating expenses are other forces with which all firms must reckon indefinitely.

Still, by the sober application of its total management philosophy, Greeley Gas has managed to thrive on every challenge.

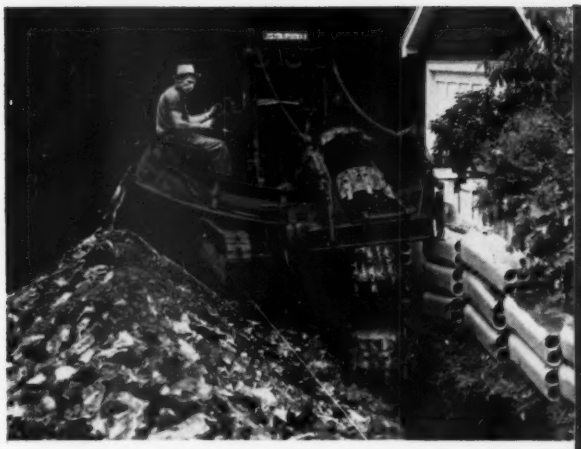
There are also at least two major advantages inherent in operating a five-district distribution system with a modest 22,000 meters.

One is flexibility to roll with a variety of punches.

The other is that, when such a utility strives conscientiously to improve to an even greater degree its service in every area where it lives and works as *"good citizen, neighbor and friend,"* the community itself often helps make problems simply vanish—and some quite remarkable progress is possible.

Certainly Greeley Gas bears impressive testimony to this enlightened progressive spirit. ■

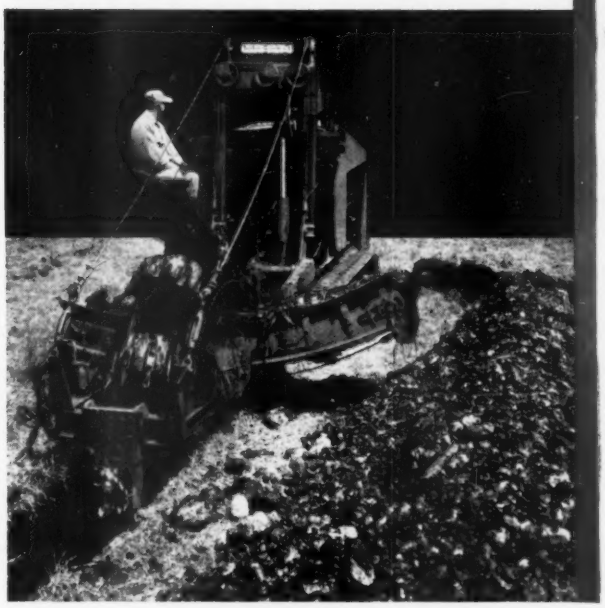
Greeley Gas hosts thousands of customers in club groups and community organizations through its Blue Flame rooms. The one shown here is in Canon City.



in close quarters...

...around curves

cross country...



** Both machines dig from 10" to 24" wide and to 5'6" deep. Model 773 has extra-wide crawlers for jobs where machine width is not a factor.*

two new Barber-Greenes ..."digginest" ditchers in their size range*

These two new Barber-Greene wheel ditchers have the all-around "digability" to make fast work of any ditching job in their size range—jobs that call for the utmost in speed, flexibility, ruggedness *and economy*. They include general utility work such as gas, water, electric and telephone services . . . drainage and excavating . . . plus the many other applications that require a speedy, dependable ditcher.

Many new, exclusive features—not available on any ditchers in their range—enable the Models 772 and 773 to dig up to 25% more ditch per day. For example, fewer moving parts mean low-cost, low maintenance operation . . . fully guarded drive chains and automatic overload protection give maximum safety . . . dual-range Hydra-Crowd transmission provides infinitely variable digging speeds from 0 to 28 f.p.m.

Write for new bulletin **describing how the many exclusive Barber-Greene advantages enable the new 772 and 773 to dig up to 25% more ditch per day.**

59-4-D

Representatives in Principal Cities of the World

Barber-Greene BG

Main Office and Plant AURORA, ILLINOIS, U. S. A.

Plants in DeKalb, Illinois..Detroit..Canada..England..Brazil..Australia

CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT

Fig. 1. This modern building in Dover, Del., houses Eastern Shore's main office and dispatching station.

Eastern Shore Natural Gas . . .
a model for

Regional pipeline planning

WILMINGTON, Baltimore, Annapolis and Washington, D. C., have had natural gas service for years. Their smaller neighbor cities, however, had to wait until this year. Eastern Shore Natural Gas Co. is now filling the gap between major metropolitan distribution centers. Along its newly opened 125-mile pipeline—from Parkesburg, Pa., to Salisbury, Md.—Eastern Shore provides natural gas to four utilities serving 14 towns in the Delaware-Maryland peninsula. Direct industrial sales are made to Tidewater Oil Co., International Latex Corp., the Seaford municipal power plant and the area's seasonal frozen food and canning industries.

These cities and industrial loads made necessary a first year peak demand service of 6.2 MMcfd for Eastern Shore. The current daily peak demand service is 8.65 MMcf, the coming year's contract is 9.13 MMcf. A peak of 12 million is projected for the winter of 1962.

Other communities along the pipeline, now getting LPG, are dealing for natural gas service. Requests for service now exceed gas that can be supplied. And, if all interruptibles were added, Eastern Shore would have an approximate 90 per cent load factor. About 11,000 customers along the pipeline will be heating and cooking with Transco's Gulf Coast gas. Another 11,000 customers are estimated within 30 miles east and west of the line.

Eastern Shore, owned by Chesapeake Utilities Corp., exemplifies modern regional pipeline planning in two important respects, according to George B. Daniel, executive vice president. First, the company stresses economical automatic operation. This assures a profit within the narrow range between its payments to Transcontinental Gas Pipe Line Corp. and the prices Eastern Shore is legally allowed to charge its customers. Second, Eastern Shore, from its inital planning to final construction, has made provision for rapid expansion in line load. The pipeline has a 24 MMcfd capacity—almost three times the load it is carrying at present.

Incorporated in 1955, Eastern Shore has headquarters and dispatching in Dover, Del. (*Fig. 1*). The modern, spacious building also houses a shop and garage. Metering stations are located at Parkesburg, Pa. (where gas is purchased from Transco); Elkton,

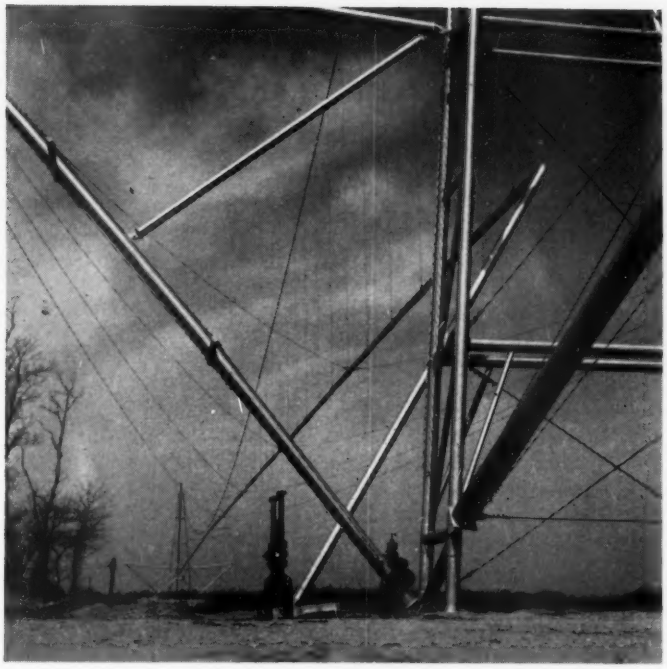
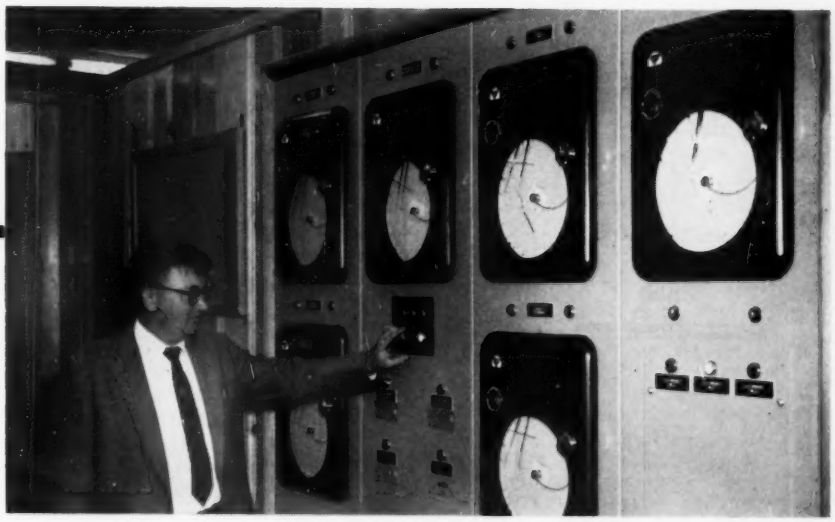


Fig. 2. Eastern Shore's pipeline makes a 1280-ft aerial crossing of Chesapeake and Delaware canal.

Fig. 3. E. L. Lohman, chief measurement engineer, regulates flow at Parkesburg from Dover dispatching station.



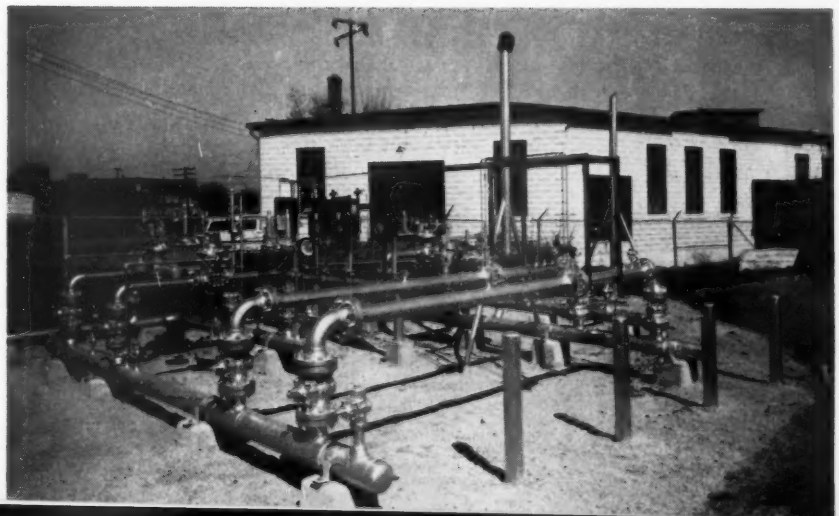


Fig. 4. Dover Gas Light Co. metering station.

Eastern Shore's 125-mile line runs from Parkesburg, Pa. in the north to Salisbury, Md. at the southern end.

Md.; Delaware Power & Light Co.; Tidewater Oil Co., Delaware; Seaford (Del.) municipal power plant; and Salisbury, Md.

Some 15 miles south of Wilmington near Newark, Del., the pipeline hurdles the Chesapeake and Delaware Canal with a 1280-ft aerial crossing (*Fig. 2*). The towers of this unique suspension bridge are 170 ft high and weigh in excess of 50 tons each.

Eastern Shore's telemetering and remote control system operates on two circuits. One circuit is used for a basic multiplexed telemetering and telecounting system. The other circuit runs the flow controller at the Transco takeoff at Parkesburg.

The American Series A-88 explosion-proof controller at Parkesburg is operated remotely from Dover. The newly designed control system operates over unlimited distance, without a polarity change. With the old control system, incorporating transfer switches and a polarity change, the maximum possible distance for remote control is 35 miles. After that, a repeater is needed in the telephone circuit. A repeater cannot handle a polarity change. Eastern Shore's new system, operating from a steady d-c coded signal, goes through the telephone company repeaters without losing the signal.

Eastern Shore makes wide use of multiplexed telemetering. So, one dispatcher at Dover can check conditions all along the line from Parkesburg in the north to Salisbury at the southern end. The instrument panel (*Fig. 3*) shows primary, secondary, and differential pressures at Parkesburg; pressure at Salisbury; pressure and flow for two orifice runs at Tidewater Oil Co.; telecountered flow from Seaford Power Plant; two flow control points in Elkton; and International Latex. Flow at Delaware Power and Light, which is not hooked in yet, will also be controlled from Dover.

To serve the towns of Dover, Smyrna, Clayton, Cheswold, Wyoming and Camden, Del., Dover Gas Co. takes 500 Mcf daily. The Dover metering station (*Fig. 4*) is equipped with a Reynolds 3-in. pilot operated, weight-loaded regulator; Bristol pressure recorder with 0-100 psig and 0-500 psig pressure springs; two American series A-88, 100-in. and 10-in. double-integrating orifice meters; two 4-in. Daniel Simplex orifice meter runs; and a single-pen 0-150 deg F temperature recorder. Inlet pressure of 125 psig is cut to 60 psig by Eastern Shore. Dover Gas reduces pressure to 20 psig for distribution. A Peerless vertical scrubber and an alcohol lubricator keep regulators from freezing.

At the International Latex metering station (*Fig. 5*), Eastern Shore uses an American 500B Ironcase meter with Base Volume Index; a pilot-operated, spring-loaded regulator; a pilot operated, weight-

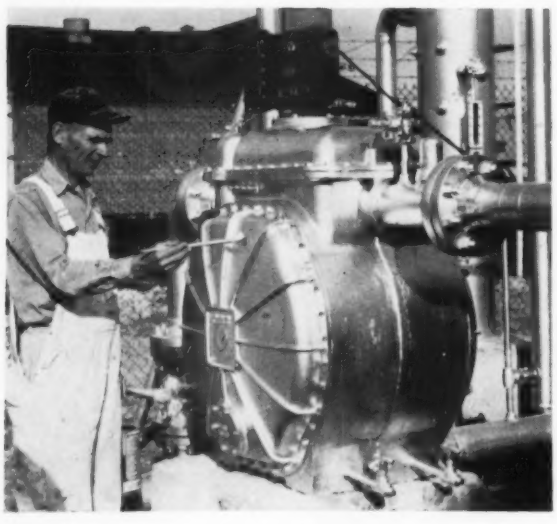


Fig. 5. Finishing touches are applied to the American 500B Ironcase meter equipped with Base Volume Index and Telecounter at Eastern Shore's International Latex metering station.

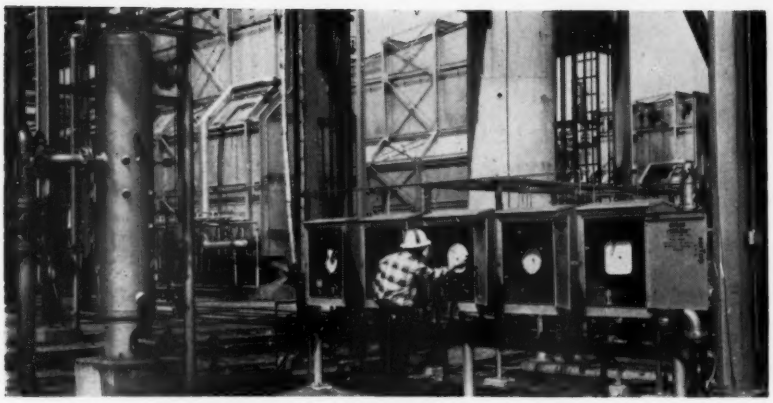


Fig. 6. Eastern Shore's Tidewater Oil Co. metering station.

loaded regulator; and a telecounter on a separate system to Dover.

The Salisbury station meters gas to Citizens Gas Co. which serves Delmar, Salisbury and Fruitland, Md. Its equipment is nearly identical to the Dover metering station.

At Seaford, two American 500B, 100-psig Ironcase meters with Base Volume Indexes measure gas sold to Sussex Gas Co. This distributor serves the city of Seaford and the towns of Bridgeville, Blades and Laurel, Del. One of the Ironcase meters, with a Base Volume Index and telecounter, is hooked into the company telemetering system, in addition to serving the city of Seaford power plant. Line and delivery pressures are recorded by a 2-pen recorder.

Tidewater Oil Co., on a 7-mile lateral from the pipeline, has its gas supply measured by two 100-in., 500-psig A-88 orifice meters on two Daniel Simplex 4-in. meter runs (*Fig. 6*). A 100-in. two-position controller is connected to a 4-in. Reliance CBVA motor valve. Two Series A-88, 100-in. flow transmitters telemeter to Dover through the multiplexed telemetering system, as does a 500-psig pressure transmitter. In addition, the station is equipped with a 0 to 150-deg F temperature recorder and a 2-pen pressure recorder, which records line and delivery pressures.

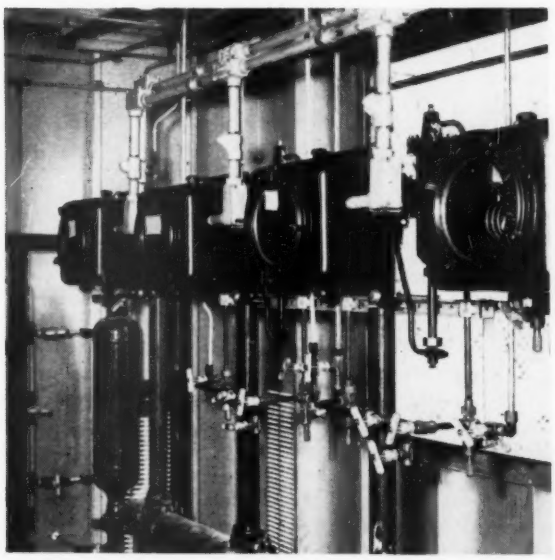


Fig. 7. Explosion-proof telemetering transmitters at Parkesburg, Pa., send data on flow and static pressure to Eastern Shore's Dover, Del., dispatching station.

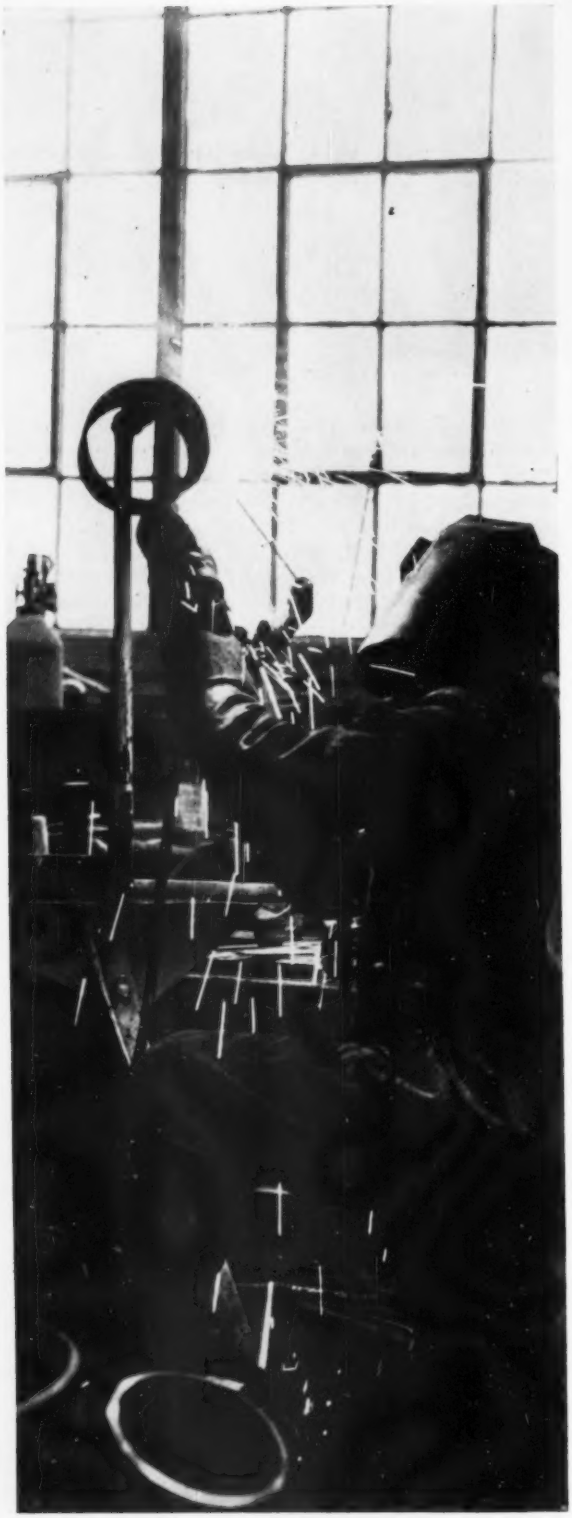
Eastern Shore's line runs through Delaware Power & Light Co.'s property, so there is no need for a lateral to serve that company. A 50-in., 500-psig Series A-20 orifice meter on a 4-in. Daniel Simplex orifice meter run measures gas going to Delaware Power & Light. An A-88, 50-in. flow transmitter and a 500-psig pressure transmitter telemeter to Dover through Eastern Shore's telemetering system. The installation has a 0 to 150-deg F temperature recorder and a 2-pen pressure recorder. In addition Delaware Power and Light has a multiplexing unit on its equipment transmitting to Wilmington for check measurement, as well as flow control to its station.

Two 500B Ironcase meters with telecounters transmit data to Dover from the Elkton metering station, which stands right on the Mason-Dixon line. A two-pen pressure recorder measures line and delivery pressures.

At Parkesburg all equipment is explosion-proof. Much of the equipment at the take-off from Transcontinental's line belong to Transco. Eastern Shore has two 50-in., Series A-88 flow transmitters telemetering to Dover on the control system. Also a 1000-psig pressure transmitter sending static pressure on meter runs and another 1000-psig pressure transmitter sending line pressure (*Fig. 7*). A remote-set pressure controller, controlled from Dover, and a manually-set flow controller are tied together to control a Fisher 3-in. motor valve belonging to Transco. The valve is controlled through a Moore high-pressure selecting relay.

On Eastern Shore's line there are six Peerless scrubbers removing dust at various metering stations. The company has designed an alcohol lubricator which is used in metering stations to prevent freeze-ups in its regulators.

Industrially, the future looks bright for the Eastern Shore area. They have available land, excellent transportation facilities, good roads, water, and now, natural gas. Delaware officials sincerely believe this area will be similar to the New Jersey side of Delaware Bay in a very short time. ■



Electric arc welding in simulated overhead position is practiced by Peoples Gas foreman Fred Kerstein. Such factors as electrode diameters, current range, thicknesses of passes, are important to this work.

Peoples Gas' Eugene O'Neill (right) demonstrates his welding skill with oxyacetylene equipment while instructor H. A. Sosnin adds pointers. Complete penetration and fusion of the root of the weld are keys here. Oxyacetylene welding produces economy and efficiency for joining smaller sizes of steel pipe.

Welders go back to school

THERE is plenty of technical reference and advice available for welding flat sheets, various beams, and other steel shapes. But pipe welding is another matter. Training material and instructors for welding pipe in diameters generally used for gas distribution systems are rather scarce.

Peoples Gas Light & Coke Co. (Chicago) met this problem by designing its own instruction and refresher course in welding. The school is operated to increase skills of company welders in the specific techniques of gas distribution steel piping welding.

The "tailor made" course at Peoples Gas was put together under the supervision of John E. Damm and Peter Shunt, supervisory engineers in the company's engineering and test departments. One of their principal sources of help and experience was H. A. Sosnin of Tube Turns Div., Chemetron Corp. This company has been a leader in manufacture of welding fittings and flanges, in a wide variety of materials, and the application of welding technology to distribution piping. ■

Quality of welded pipe joints is controlled by (1) quality of the pipe, (2) welding procedure used, and (3) ability of the welder. Above left: pupils in Peoples Gas distribution welding school learn or relearn these precepts by doing.

The surface appearance of welds cannot give positive knowledge of soundness (above right). Here, a sample of the work is placed under tensile load. This is just one of the mechanical tests made to determine quality of welds at school.

Above: Comments on physical characteristics of welding bead and electric arc technique are exchanged by "instructor" H. A. Sosnin and "pupil" Martin Walsh, Peoples Gas foreman. Perfection of difficult overhead welding technique is stressed.

Right: Flame cutting is important part of welding course just as it is important in distribution system piping construction. Gay Rignor makes it look easy as he uses oxyacetylene cutting head to cut pipe to length during classroom course.

Washington • *Cont'd.*

from page 17

While some of the criticism heaped on them last year during the influence-peddling scandals has died down, they are still under heavy pressure to change their ways in various respects. (The agencies are called independent because they are creatures of Congress, not part of the Executive branch of government.)

The House Commerce Committee proposed sweeping new anti-influence laws last January. It has spent this year getting comments and waiting to see just how much the threat of new rules makes agencies clean their own houses.

But Committee Chairman Oren Harris (D., Ark.) is making it clear in private talks to officials of independent agencies, and to other congressmen, that he'll press for passage of some legislation next year. The final version will probably be somewhat changed from that originally proposed. But it will still be tough.

The Harris influence-peddling probe which brought to light the Goldfine-Adams affair and the Mack trial, has had its effect on FPC. In June, the commission caused quite a stir when it asked for comments on proposed new rules which would bar congressmen and private citizens from talking privately to commissioners and examiners about the merits of pending cases.

It also announced it was considering making letters to commissioners public when they discuss matters pending before the agency.

The controversy over what is "proper pressure" and what is "undue influence" flared before the Harris Committee at one session. Some congressmen believe that when lawmakers who control the purse strings of agencies talk to commissioners, some influence is bound to be exerted.

Others argue that they have a "right and duty" to represent constituents "where the public interest is involved."

FPC Chairman Jerome Kuykendall replied that congressmen's appeals "actually don't have much weight with us."

Gas industry spokesmen have appealed to the Committee not to pass any legislation which would restrict "free access" between commissioners and all parties.

On the antitrust front, there is a smoky battle of bureaucrats underway. It revolves around the antitrust immunity many regulated industries believe they have been given over the years.

In the past year or so, however, fired-up trustbusters have been punching holes in this taken-for-granted immunity. Even though the holes are small now, agency officials are raising the roof.

Federal Communications Commission Chairman John Doerfer has been quoted as demanding that the Justice Department antitrust division "stay in its own backyard." He has contended with some heat that "they (the trustbusters) don't understand the broadcasting industry or why the FCC was created."

Doerfer's open blast at his fellow bureaucrats drew quiet, but

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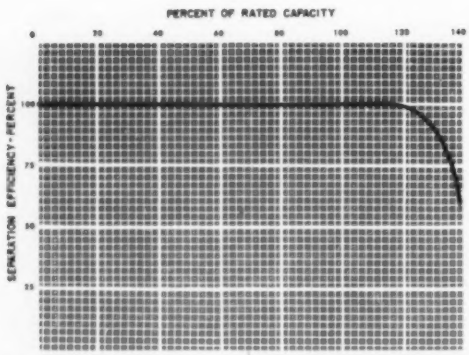

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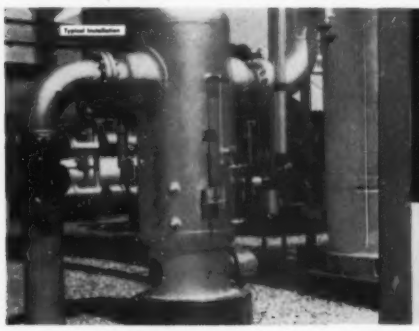

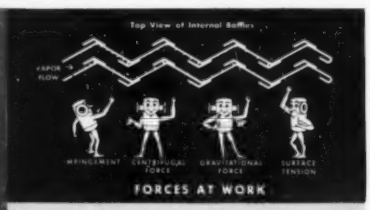

The above illustration shows a top view looking down at two of the many internal separator baffles. Entrained liquid droplets are caught in the pockets and drained down out of the gas flow . . . thereby completely stripping the gas before it leaves the mist extractor.

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strong, support from other agencies, including FPC.

The power commission was involved in one of the first recent tests of antitrust immunity. This involved an antitrust suit against the proposed acquisition of Pacific Northwest Pipeline Corp. by giant El Paso Natural Gas Co.

El Paso and PacNorWest at first proposed only a stock combination, which is outside FPC's control. Justice Department immediately challenged it, and the two firms then extended the merger to include assets and went before FPC.

A court at Salt Lake City refused to dismiss the charges on grounds that FPC had sole antitrust jurisdiction, but dodged the issue by holding the case in abeyance until FPC rules.

THE Federal Reserve Board is finally realizing that the natural gas industry is an important member of the U. S. economic family.

For years, FRB has been spending millions of dollars a year computing an index of industrial production. It shows how fast economic wheels are turning, how much they slow down in recessions and how much they speed up in recovery periods.

The index is a complicated statistical system of measuring output in various key industries. Steel, autos, homes, consumer goods, transportation, and others have had their pulse taken for years.

Now as a result primarily of the latest business recession and recovery, FRB has discovered that its index isn't too accurate. There are too many major industries which aren't included.

So the index will be revised. Natural gas production will be added. Other industries, such as the electric industry, have been included for some time. But their relative importance and growth have not been properly weighed, FRB admits. This will be corrected in the new index.

As a result, 1959 gas production is expected to hit at about 165 per cent of the benchmark 1947-49 average. This is about 10 per cent higher than the unrevised index had shown. ■

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has Large, Easy-to-Operate

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Vise base, that overhangs front legs for clear tool swing, has hanger slots for tools, 3-size pipe bender, rear pipe rest and adjustable ceiling brace screw. Folding legs and integral tray set up easily and lock in position for rigid work base. Snap chain holds folded legs closed for easy carrying . . . no loose parts. Rubber grommets in tristand feet prevent creeping. See and try this more-for-your-money RIDGID Top Screw Chain Vise at your Supply House!

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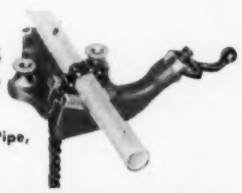


5 Sizes for ⅛" to 8" Pipe, Conduit or Rod

The Ridge Tool Company, Elyria, Ohio, U.S.A.

The fifth-wheel mounting on United Fuel's Hydrocrane (shown above) resulted in considerable saving for the company.

Hydraulic crane and five-wheel truck cut operating costs

AN all-hydraulic crane mounted on a special truck with fifth wheel has enabled the United Fuel Gas Co. to effect a considerable savings at its new operating center at St. Albans, W. Va., near Charleston.

So says Walter Showen, manager of the operating center, who helped design the mounting for the subject crane—a 10-ton Bucyrus-Erie H-5 Hydrocrane. Mounted on a cab-over-engine Mack H-64 truck with a 228.5-in. wheelbase, the H-5 has been on a cost-cutting binge since its delivery in May 1958.

The fifth wheel made the savings possible. With a trailer attached to the fifth wheel, the H-5 can perform alone the loading and unloading chores that formerly required two separate units—a crane and a truck. The need for a truck and a crew has been eliminated. An operator and two men on the choker accompany the H-5.

United Fuel is the principal company among seven which make up the Charleston Group Companies of Columbia Gas System. The operating departments include transmission, distribution, compressor, production and storage, gas measurement, communications and transportation. In a large area around group headquarters at Charleston, the operating center supplies these departments with their material needs—pipe, fittings, meters, among others—and does all fabricating, machining and major equipment work.

The 60-acre operating center is located just off state route 17 and borders the Kanahawa River and a spur of the Chesapeake & Ohio Railroad main line. Approximately 6.35 acres are concreted for pipe storage. Shipments are received and made via barge, rail or truck.

United Fuel Gas' H-5 has a two-section boom that telescopes from 24 to 36 ft. All of the machine's operating functions are hydraulic. Four outriggers, hydraulically controlled from the operator's station, provide a stable working platform.

Showen, who had served 36 years in the company's compressor department, was named manager of the operating center in December 1956. The equipment budget already was set, and it included the purchase of fork lift trucks and load carriers for pipe loading.

In January 1957, Showen got an idea: Why not

Workmen prepare to attach a 15-ton Fruehauf tandem-axle trailer to the fifth wheel.

With trailer attached, the Hydrocrane is ready to go to the barge unloading area.

mount a crane on a truck with fifth wheel? That way the same unit could be used for loading, unloading and hauling.

Showen sought to have designed for the crane a truck mounting with a 20,000-lb rating on the front axle and 17,000 lb on the rear axle, yet be fully maneuverable through the 30-ft wide aisles of the pipe storage area. Bucyrus-Erie, Mack, a United Fuel Gas compressor engineer and another engineer all assisted in the project before it was finished.

One of the first designs was a truck with a 269-in. wheelbase. It wasn't maneuverable. But it was found that almost 4 ft could be cut off. After seeing the H-5 in operation and taking pictures of it, the compressor engineer began cutting inches off the design. Mack came up with the 228½-in. truck (the standard mounting for an H-5 has a 158-in. wheelbase).

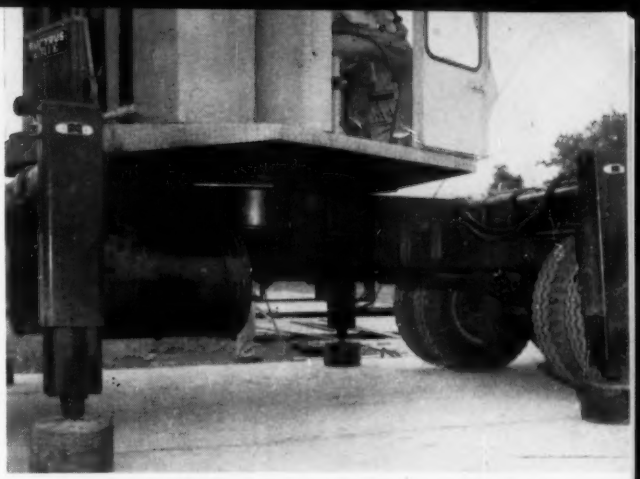
The UFG mounting has 15,200 lb of dead weight on the front axle. Overall crane and truck weight is 38,000 lb. About anything within a 60,000-lb limit can be hauled.

The H-5 has been averaging six hours of actual work per day. Its usual routine is to load and unload pipe and equipment such as bulldozers, compressors, welders and forgings. The pipe ranges in diameter from 1.5 to 33 in.; length, 21 to 50 ft; and weight, 2.5 to 120 lb per ft.

The barge landing lies about 150 ft below the pipe storage area. A specially rigged, long-boom Manitowoc crane unloads pipe and materials from barges. Here is where the H-5 steps in, pulling a 15-ton Fruehauf tandem-axle trailer with fifth-wheel mounting. The other crane loads the piping and other supplies from the barge onto the H-5's trailer (although the H-5 sometimes loads its own trailer from material already on the bank). The H-5 pulls the trailer to the proper station for unloading.

Before purchase of the truck crane, the operation involved a crawler-mounted crane and truck. The truck crane and its trailer have eliminated an extra truck, its driver and helper. The crawler crane still works in the storage area.

In addition the truck crane has been sent off base to install air conditioning units and to deliver and pick up pipe and other supplies. ■



First step prior to pipe loading or unloading is positioning the unit's four hydraulically controlled outriggers to provide a stable working base.

Above: a bundle of 33-ft long, 3-in. pipe is loaded to the trailer.

Below: En route to the unloading station with the 3-in. pipe, the H-5 goes to the storage area to load 20-ft, 10-in. pipe onto a truck for delivery to a point in West Virginia.

Operator turns a corner in the storage area to show the maneuverability of the H-5 with loaded trailer.

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GAS NEWS

Lower rates for air conditioning users

Washington (D. C.) Gas Light Co. has a green light to try to win new gas air conditioning customers. The lure: special low summer rates.

District of Columbia's PUC okayed the lower rates for both residential and commercial air conditioning customers on Aug. 1. Reductions amount to between 30 and 40 per cent.

For residential customers, the new rates will be in effect from June through October. According to the company, a bill for running a 3-ton gas residential air conditioner under the new rate will average $58.81 for the season, a reduction of 40 per cent from the old rate.

Commercial customers' summer air conditioning rate will run from May through November. Cost of running a commercial unit operated all year will range from $120 for a 5-ton unit to $2556 for a 150-ton unit for the season. Old rates were $168 to $4079.

For commercial units operating only in the summer, cost will be $168 to $3254.

Washington now has some 336 residential air conditioning customers and 157 commercial.

ASME issues 1959 edition of pressure vessel code

The 1959 edition of "Unfired Pressure Vessels" has been released by the American Society of Mechanical Engineers. This is Section VIII of the ASME Boiler and Pressure Vessel Code.

All changes made since 1956 are included in the new book. Most changes have appeared as addenda to the code. They are now part of the text. One of the major revisions concerns a ruling on nodular cast iron.

Copies of the new edition are available from the ASME, 29 W. 39th St., New York 18. Price: $6.

Consumers adds heat users

Consumers Power Co. is connecting 30,000 space heating customers in its Michigan service area. The new connections are possible because Consumers is getting an added 100 MMcfd from Panhandle Eastern Pipeline Co. Supply is expected to double in the second year. The gas became available when Panhandle stopped supplying Michigan Consolidated Gas Co.

Consumers has a current backlog of 170,000 applications for space heating.

Unity group adopts successful Milwaukee plan

Bruce A. McCandless, vice president of Milwaukee (Wis.) Gas Light Co., is the new chairman of the Gas Unity Committee. The committee was set up in 1957 to develop a program of local-level education and advertising to promote the use of gas — both city main and LPG.

The committee has selected the Milwaukee Plan as a pattern for future operations. H. Leigh Whitelaw, committee secretary, said the Wisconsin operation "has helped clear public confusion that usually results from promoting two different gas industries." The Milwaukee plan involves a gas utility and LPG dealers in a 25- to 30-mile area surrounding Milwaukee.

"It was important to impress consumers with the fact that gas service is available wherever they live," said Whitelaw. "The Milwaukee Plan has succeeded in making this impression through a cooperative program that faces up to practical competitive problems and converts them into mutually advantageous sales potentials."

Text of the Milwaukee plan will be distributed by AGA to all gas utility members. The Liquefied Petroleum Gas Association will distribute it to its members.

Industrial services cited

Niagara Mohawk Power Corp., Syracuse, N. Y., has published a folder outlining plant location services in Upstate New York, the company's service area.

Designed as an aid to industries considering new plant sites, the pocket-sized folder spells out specific services available to industry through Niagara Mohawk.

HOW THE ARROW IS CUTTING COSTS FOR SERVICE CUTS

GAS COMPANIES *in all parts of the country* are realizing substantial savings in making service cuts by using the ARROW Mobile Hydraulic Hammer. One man and an ARROW can do the work of six men using air tools to break concrete, cut asphalt or compact trench backfill... and the ARROW does the job better.

Hydraulically controlled striking power — The operator of the ARROW Mobile Hydraulic Hammer can set the hammer control upon automatic to deliver blows of uniform impact, up to 8,000 ft.-lbs. Or he can control the hammer manually. Also, he can use the exclusive ARROW creeper-gear to move the machine at uniform speed up to 32 ft. per min. A wide range of quickly interchangeable hammer points and tools makes the ARROW ideal for a wide variety of jobs. The ARROW is constructed to give years of rugged service under constant pounding.

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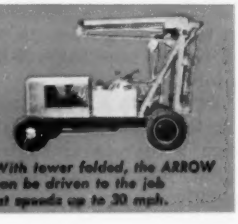
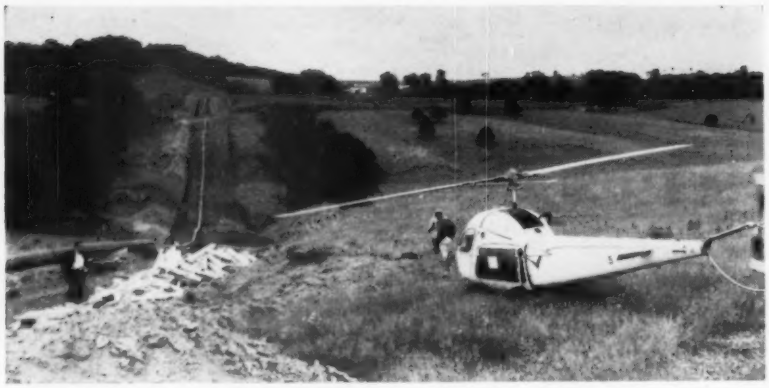
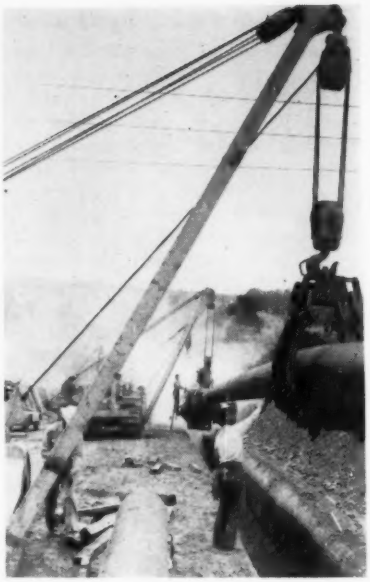


With tower folded, the ARROW can be driven to the job at speeds up to 30 mph.



Air inspection of pipeline progress helps construction foreman coordinate installation activities that spread over about 50 miles. Welding crews have finished job here on section of NI-Gas' new 140-mile line.



Doping and wrapping proceeds on NI-Gas' line from East Dubuque to DesPlaines.

13-year wait nears end for NI-Gas customers

A 50 MMcfd gas supply will soon be flowing through Northern Illinois Gas Co.'s 140-mile line from East Dubuque to DesPlaines. More than 41,000 customers anxiously await its completion so they can fire their heating equipment with natural gas from Northern Illinois' lines.

About 1100 railroad carloads of 22-in. pipe is stockpiled at five points along the new line's route. Storage areas across northern Illinois are in Woodbine, South Freeport, Byron, Kirkland, and Spaulding.

Stringing is progressing eastward a couple of miles per day.

For 13 years, Northern Illinois had to restrict gas heating. In those 13 years, NI-Gas' supply was quadrupled. Number of heating customers increased 10 times over, from 35,000 in 1946 to an expected 350,000 next winter. Vast progress was made in bringing more gas to Illinois from the Southwest. But demand soared higher than supply.

This spring, more than 100,000 single-family homes were on NI-Gas' waiting list for gas heat. The list grows by about 2500 per month.

But now the company can look forward to two new major supply lines. One is the East Dubuque-DesPlaines line, which will move gas from a Northern Natural Gas Co. line from the Southwest.

The other big project is Midwestern Gas Transmission Co.'s new system from Tennessee to Joliet. The 60 MMcfd which will arrive at Joliet for NI-Gas will make gas heat possible for 65,000 more customers.

In addition to the 106,500 single-family homes, limited service will be available to multi-unit dwellings, schools, churches, municipal buildings, and commercial and industrial establishments. They too have waited 13 years.

Second space heat offer made by Peoples Gas

Peoples Gas Light & Coke Co. has made its second space heating offer of the year. The Chicago-based company filed its petition with the Illinois Commerce Commission.

It wants to service all 16,500 applicants in single-family dwellings and two-apartment units on its waiting list. This is the first time since 1946 that Peoples Gas has been able to offer space heating to all applicants on the waiting list in these categories. A waiting list of future applicants will be maintained.

Peoples Gas also asked to extend service to some multi-family dwellings with central heating, and to some commercial and industrial premises.

With this latest extension, Peoples Gas will have offered heating service to 92,000 Chicago applicants in one- and two-family dwelling groups during 1959.

Attendance records set at corrosion course

With 520 people present, the fourth annual Appalachian underground corrosion short course set a new enrollment record. Students came to West Virginia University in Morgantown from the U. S., Canada, and Cuba.

New officers for the 5th annual course are: general chairman, C. M. Rutter, Equitable Gas Co.; program chairman, D. A. Tefankjian, Texas Eastern Transmission Corp.; exhibits chairman, G. G. Campbell, West Virginia University; publicity chairman, John H. Alm, Dearborn Chemical Co.; and registration chairman, R. E. Hanna, Jr., West Virginia University.

The general committee will meet in December to set dates for the 5th session.

New rate plan proposed

A bill permitting the state regulatory body to fix rates in relation to operating costs of utilities is under study by the Pennsylvania legislature.

Under the measure, the PUC "may disregard the fair value" of utility property in rate fixing. As an alternative, the PUC could "fix the fair return in relation to the fair and reasonable operating expenses, depreciation, taxes and other costs of furnishing service."

Waste heat report issued

"The Significance of Waste Heat Recovery Methods to the Gas Industry" is a new research report. It is issued by the AGA committee on industrial and commercial gas research.

Summarized is heat recovery equipment now in use. The report points out that waste heat recovery is applied today not so much to reduce fuel cost, but to increase production and improve product.

The report, based on studies conducted at the Polytechnic Institute of Brooklyn, is available from the AGA, 420 Lexington Ave., New York 17. Price: $3.

Gas company executives get together during Columbia University's executive program in business administration at Arden House, Harriman, N. Y. From left: John J. Carter, manager-gas department, Humble Oil & Refining; John H. Byrnside, assistant secretary and counsel, Hope Natural Gas Co.; and James E. Allison, vice president, Texas Gas Transmission Co. Talking things over with them is Hoke S. Simpson, director of the program, which has completed its 14th session in eight years.

Carolina extension okay

Carolina Pipeline Co. has state approval of its plan to build a line from Aiken to Pontiac in Richland county, N. C. The line will connect with Southern Natural Gas Co.'s meter station at Aiken.

Also approved was Carolina's proposed spur line from the Aiken-Pontiac line north of Columbia to Winnsboro. In addition to Winnsboro, the new line will serve Conway, Myrtle Beach, and Georgetown.

Estimated cost of the line is $5 million.

A MANUAL ON THE USE OF

Plastic Pipe and Fittings

in the Natural Gas Industry

This manual provides a wealth of background information invaluable to gas distribution men responsible for plastics pipe applications.

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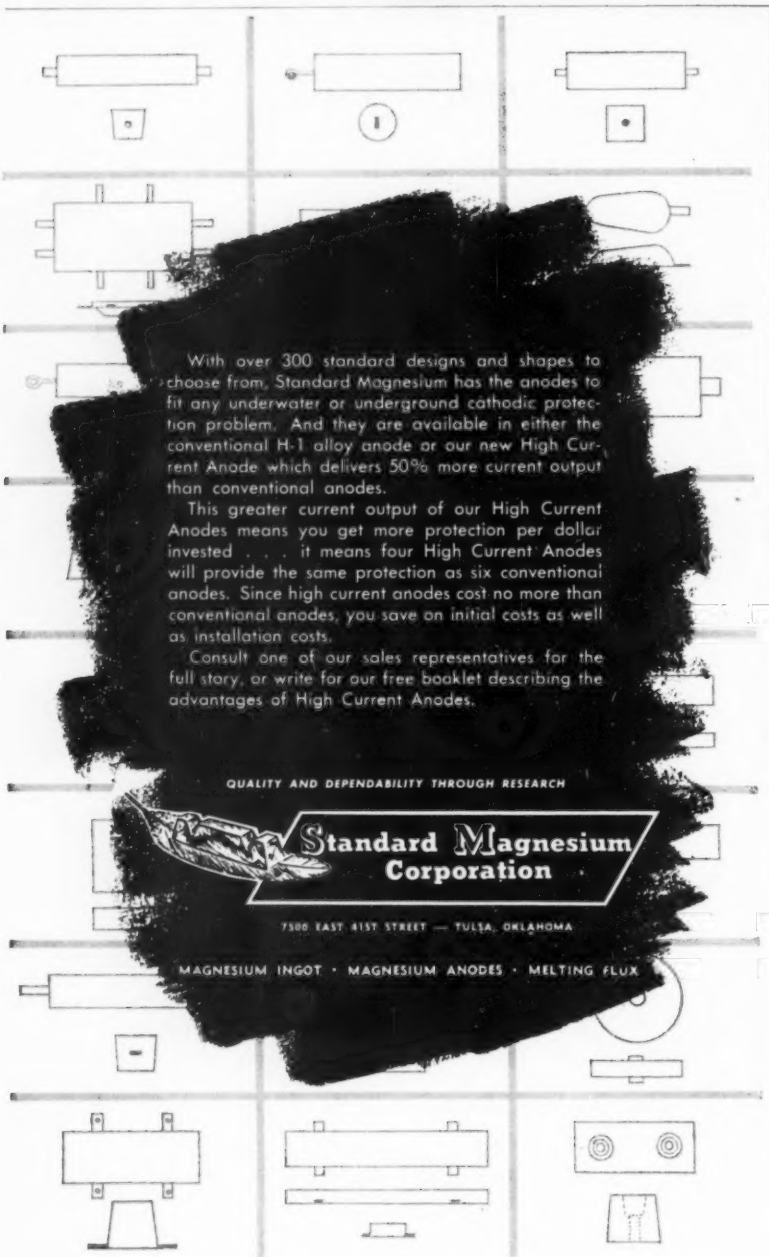
Range offers "choose your own accessories" plan

A customized gas range with accessories is on display at Peoples Gas Light & Coke Co. showrooms in Chicago. Crown Stove, Chicago, recently introduced this new merchandising idea.

There are seven basic models. The housewife can select any one or all of a variety of accessories to be built into her choice. According to Crown, there are actually 800 different combinations available under the plan. Included are 30-, 36-, and 40-in. ranges.

Once the buyer selects her basic model and accessories, the company proceeds with manufacturing operations. When the range is finished, a gold-plated metal plate is attached bearing the buyer's name and stating it was custom built for her.

New addition to AGA headquarters reception room is this mural of "The Miracle of Natural Gas." It was presented by Walter Stake (right), regional vice president of A. O. Smith Corp. Looking on are from left: Harold Massey, GAMA managing director; C. S. Stackpole, AGA managing director, who accepted the painting for the association; and S. E. Wolkenheim, vice president for marketing, A. O. Smith. The painting, originally used in A. O. Smith advertising, is by Robert Handley. It won the merit award of the Art Directors Club of Milwaukee.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Robertshaw building plant in South America

A newly formed subsidiary of Robertshaw-Fulton Controls Co. will produce appliance controls in suburban Sao Paulo, Brazil.

Robertshaw president T. T. Arden said automatic thermostatic controls will be available to the growing number of appliance makers in Brazil.

Plant site is on a superhighway connecting Sao Paulo and Rio de Janeiro. The new company will be known as Robertshaw-Fulton Controls do Brasil S/A Industria E Comercio. It will be owned by Robertshaw and several Brazilian firms.

General manager is Anthony A. DeStefano, associated with the company's thermostat division for the past eight years.

Aerotec merger complete

In effect is the merger of Aerotec Corp. and Thermix Corp. (both of Greenwich, Conn.) and Aerotherm Corp., Bantam, Conn.

Executive offices of the new corporation are in Greenwich. Officers are Louis C. Whiton, chairman of the board; John E. Watson, president; Jacques G. Mejean, executive vice president and treasurer.

Aerotec Industries will continue to market all products of the merged firms.

Human relations seminar for distribution heads

An unusual training program for distribution supervisors was held recently at Georgia Tech in Atlanta. Its purpose: help supervisors by providing them with a practical, working knowledge of human relations. Joint sponsor of the course was Southern Gas Association.

Subjects covered during the one-week school; principles of supervision, practical psychology for supervisors, motivation and work assignments. Also covered were safety, customer and public relations, and principles of training.

The only time devoted to technical aspects of gas distribution was a tour of Atlanta Gas Light's propane-air plants and two night seminars.

Twenty-eight gasmen from 14 gas company-members of SGA attended. Faculty was composed of the Georgia Tech staff and specially qualified instructors from the gas industry.

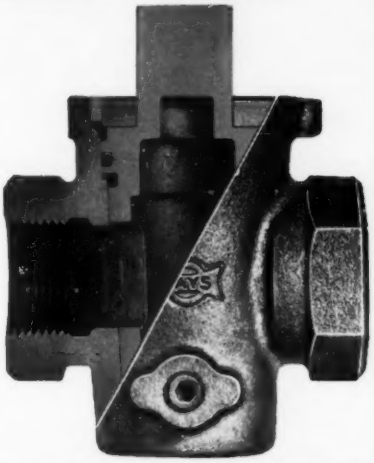
New gas-fired air conditioner introduced

A new remote type gas-fired air conditioning unit was introduced recently by Payne Co., La Puente, Calif.

Test models of the Miracool unit have been in service for the past year in various parts of the country. The air conditioner is an air-cooled absorption refrigeration unit that supplies chilled water to a cooling coil. It can be adapted for use with companion upflow, downflow, or horizontal furnaces using matched coils. Or, it can supply cooling alone with a fan-coil blower unit. Combination installation permits complete year round gas-fired air conditioning.

Continued on page 100

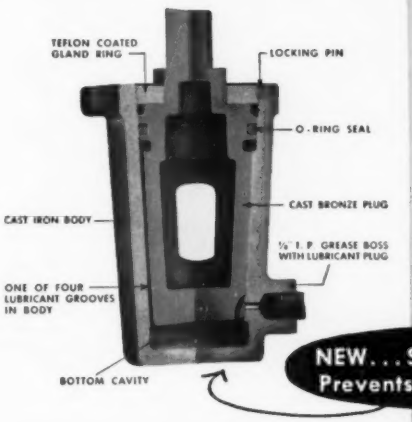
THIS GAS STOP WILL *NOT STICK...*



- A newly designed HAYS Lubricated and Tamper-Proof Gas Stop . . .
- Stop is completely lubricated at the factory . . .
- Four Grooves in body, and Lubricant Plug provide for pressure re-lubrication . . .
- Locking Pin positively prevents tampering at top of stop . . .
- O-Ring prevents top leakage . . .
- Teflon Coated Gland Ring reduces friction between top of plug and gland ring...

Re-Lubrication does the *TRICK*

HAYS LUBRICATED TAMPER-PROOF SAFETY GAS STOP*



- Lower initial and turning torque . . .
- Extra grade gray iron body, gas service bronze plug . . .
- Individually tested . . .
- Black or Galvanized, Flat Head or Lockwing Pattern...
- Sizes: ¾", 1", 1¼", 1½", 2", for 125 psi. W. P.

Write for Folder 121 and prices.

*Patent applied for.

NEW... Solid Bottom Construction Prevents Leakage and Tampering

HAYS® GAS SERVICE PRODUCTS
HAYS MANUFACTURING CO.
ERIE, PA.

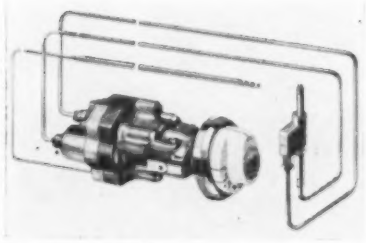
GAS DIGEST

New Products and Trade Literature

For more data on any of these items use the Readers' Service Card on pages 97, 98

1. Sealing gate valve

Flow control on gas distribution lines is handled by W-K-M's new pressure sealing steel gate valve. Tight seal—both upstream and downstream—is provided. The gate valve comes in ASA 150- and 300-lb classes and in a range of sizes from 2 to 30 in.
W-K-M Division

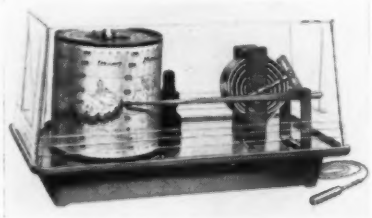


2. Combination valve

Wilcolator has announced its new Model Y high capacity combination gas valve, automatic pilot, oven temperature control, and pilot filter. The automatic pilot functions as a safety valve. The control is available in two models: (1) main burner must be off to light the pilot; and (2) pilot may be lit by lighting main burner.
Wilcolator Co.

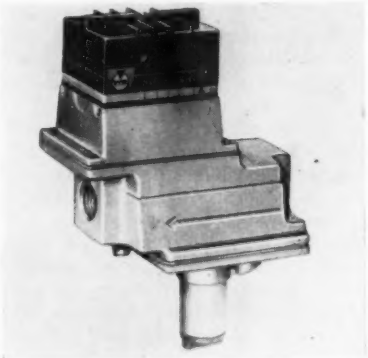
3. Automatic chart changer

A new device automatically changes circular recording charts. With the Automatic Meterman, up to 40 circular charts can be used in a single recorder. It disengages charts, one by one, at virtually any desired time/date frequency. And, it drops them into a self-contained storage box.
Maeder-Squier Co.



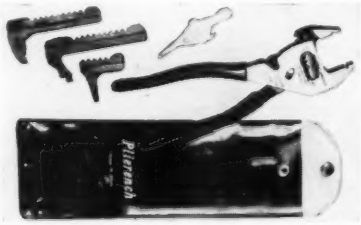
4. All-weather thermometer

Outdoor temperature is transmitted to an indoor chart with a new all-weather recording thermometer. Permanent record of daily low and high readings is obtained. Record traced on chart is a permanent six-month log of each day's minimum and maximum temperature. It clearly indicates seasonal temperature trend day by day and month by month.
Degree Day Systems



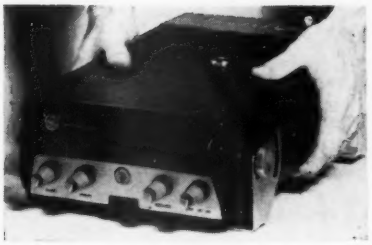
5. Gas valves

The new series of Silent Knight gas valve-pressure combinations features silent operation and compact size. A unique vent device in the regulator gets rid of time lag and flame flashbacks when main valve calls for gas. The new combinations were designed to save installation time and space on all types of domestic heating plants.
White-Rodgers Co.



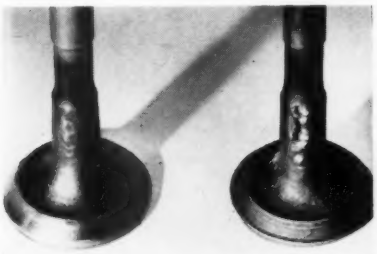
6. Pocket tool

Plierench is a multi-purpose pocket tool featuring a geared transmission for super-gripping power. With only the slightest pressure on its handles, Plierench holds even a greased ball-bearing so firmly that a 150-lb weight can be safely suspended from it.
Plierench Inc.



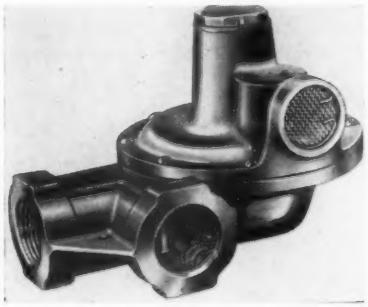
7. Two-way radio

G-E's new transistorized two-way radio equipment is said to be the highest powered transistorized model, the smallest size, and the lowest battery drain available in the mobile communications field. The Transistorized Progress Line comes in units up to 75 watts. The line ranges downward to 30- and 10-watt units.
General Electric Co.



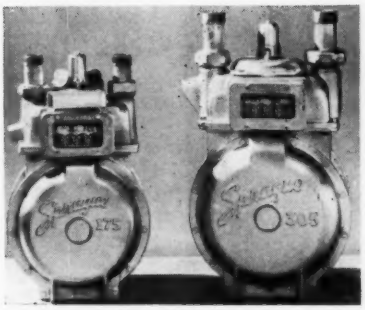
8. Hard-facing

Spray-welded Cermet actually fuses with parent metal, rebuilding valves, spindles, transmission shafts, blades, dies and pump sleeves. According to Republic Hardfacing, it stops wear, burning, and corrosion.
Republic Hardfacing Corp.



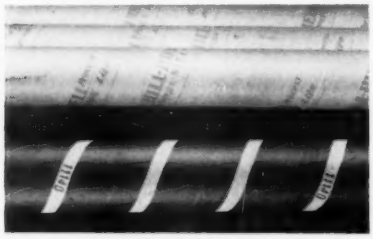
9. Compact service regulator

Fisher's compact ¾- or 1-in. service regulator matches small meters now being put into service. Series 250, of aluminum die cast construction, is rated at 250 cfh, 2-psi inlet pressure, and 1-wc drop in outlet pressure. It handles intermediate distribution pressures up to 100 psi.
Fisher Governor Co.



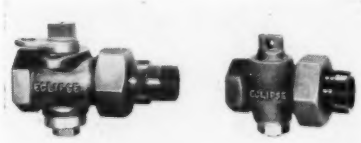
10. Insulating meter nuts

Universal insulating meter nuts of special design and size are available for use on Sprague No. 1A and No. 2 combination meters and regulators. Until now, the insulating nut usable on 1A meters interfered with regulator spring case or combination meter cover, thus preventing its use. The new design eliminates this.
Universal Controls Corp.



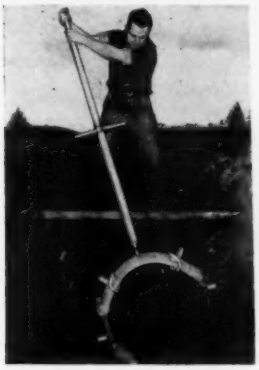
11. Pipe identification

Hill, Hubbell has combined a coded tape with pipe coating and wrapping for positive pipe identification. "Data-Tape" incorporates a kraft paper tape, stamped at 2-ft intervals with coded intelligence. The code tells the pipe's maker, its wall thickness, chemistry and type of manufacture. The tape is spiral-wrapped around the pipe over the last protective coating application. It is then covered with kraft paper. To identify the pipe, one merely tears back the kraft wrapper to uncover the code.
Hill, Hubbell & Co.



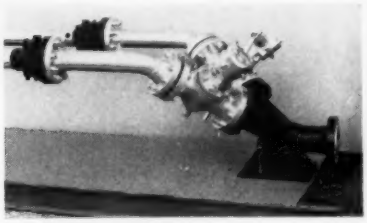
12. Insulated gas cocks

Eclipse is offering Wedgeseal-insulated, iron body brass core gas cocks with male or female thread union ends. They combine dependable, long-lived shutoff with a strong and effective means of insulating mains and services from stray or induced house currents.
Eclipse Fuel Engineering Co.



13. Rotary pipe cutter

Portability, fast one-man operation, clean, accurate cuts—these are the features claimed for a new line of rotary four-wheel pipe cutters. Reed has designed them for large steel and cast iron pipe, from 12- to 24-in. diameters. The cutters consist of a separable circular frame joined at midsections by hinged screws and adjusting nuts.
Reed Manufacturing Co.



14. Flow distributor

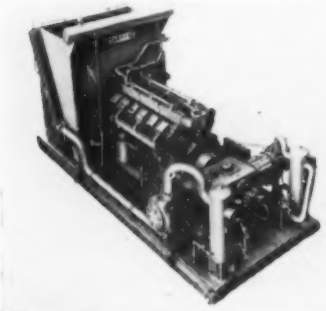
The "Y" shaped fitting (at right in photo) fills a need in measuring and regulating stations. The fitting streamlines flow through a station by splitting a stream accurately. There is no place for liquids and pipeline foreign matter to build up in the fitting. And there is no flow impingement. The fitting also reduces noise, vibration, pressure drop and hydrate formations.
Rutherford Co. Inc.

15. Accounting machines

Burroughs' new line of automatic accounting machines is said to be one of the most important advances in conventional bookkeeping equipment in the past decade. The fully automatic mechanical accounting device is equipped with a "dual printer." This special feature increases operating speeds.
Burroughs Corp.

16. Pipeline information

A new pipeline information system measures, transmits, indicates and records flow, pressure, temperature and other pipeline variables in digital form. Variables at remote points are measured and data relayed by means of standard communication or telemetering equipment to a central control station. There it is converted into digital form and recorded by automatic typewriter.
Fischer & Porter Co.



17. Field compressor

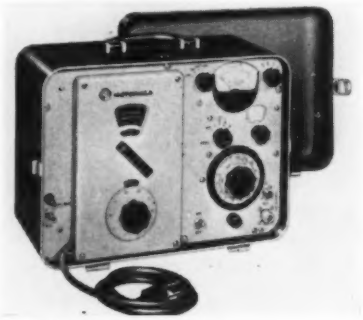
Model CFB has been added to Clark Bros. line of packaged compressors for gas and oil field use. The new unit features a 5-in. stroke, two-cylinder, balanced/opposed compressor built in hp sizes from 200 to 350 bhp. It is for single or two-stage applications where greater capacity is required in a two-cylinder machine.
Clark Bros. Co.

18. Heat exchange structure

The new Aimco heat exchange structure offers maximum stability and easy erection. The housing has a 4:1 safety factor using a 30-lb per sq ft wind load, which enables it to withstand winds of hurricane velocity and earthquakes. It is shop fabricated with jigs to minimize field erection.
Arrow Industrial Mfg. Co.

19. Mobile hammers

Breaking concrete, cutting asphalt, and compacting trench backfill are some of the jobs for the Arrow mobile hydraulic hammers. Controls can be set to deliver blows of uniform impact, or the hammer can be controlled manually. A special punch attachment is used with the Arrow hammer for making small diameter test holes to locate gas leaks.
Arrow Manufacturing Co.



20. Signal generator

A new FM signal generator is designed for servicing FM mobile, portable, and fixed station radio. Model T1034-A covers six RF frequency bands between 25 and 960 mc. Ranges are 25-32, 32-41, 41-54, 140-175, 400-470, and 890-960 mc. Each range is individually calibrated to an accuracy of plus or minus 0.5 per cent.
Motorola Inc.

21. Combustible gas analyzer

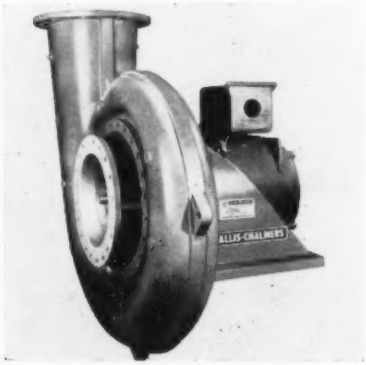
A new battery-powered detector permits field or remote location operation. The Anal-O-Graph is designed primarily to distinguish natural and manufactured gas from soil gas, LPG, and petroleum vapors by component analysis. In addition to qualitative analyses, accurate quantitative analyses are possible when constant temperature conditions prevail.
Gas Purifying Materials Co.

22. Burner system

Wherever hot air in motion is used for industrial drying, baking, or curing, the new Airflo gas burner system provides extreme flexibility of temperatures and loads because of its 25:1 throttling range. Airflo is based on the principle of using some oxygen from the stream of air being heated.
Maxon Premix Burner Co.

23. Tough-job regulator

Reliance type 299 pressure regulator meets the severe conditions found at wellheads and in gas field collecting and transmission lines. Semi - balanced, single - seat, angle-type regulator has maximum inlet pressure of 3000 psig. It is engineered for trouble-free service.
American Meter Co.



24. Single-stage compressor

Allis - Chalmers has modernized and standardized its scroll case, single-stage compressor line. The redesigned line is suitable for a

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wide range of uses, including diesel engine scavenging and supercharging, gas boosting and exhausting, oil and gas burning.
Allis-Chalmers Mfg. Co.

25. Pre-assembled joints

Tube Turns is pre-assembling insulated flange joints in all pipeline sizes. Pre-assembly avoids difficulties in field assembly of insulated flanges used to check electrolytic corrosion in underground piping. It also makes possible certification for maximum operating pressure and guarantees zero electrical conductivity.
Tube Turns Division

TRADE LITERATURE

26. Combustion safeguard

Protectofier combustion safeguard control for heating and heat-treating jobs is covered in a 4-page bulletin. These units provide continuous protection against fires or explosions from build-up of combustible fuel mixtures in either single or multi-burner installations.
Protection Controls Inc.

27. Lab chromatograph

A laboratory chromatograph from Consolidated Electrodynamics is featured in a 16-page booklet. The illustrated brochure has sections on principles of chromatography, applications, analysis, accessories and specifications.
Consolidated Electrodynamics

28. Gas turbine engine

A catalog sheet describes the Turbo-Mite, a lightweight, miniature gas turbine engine. The illustrated 2-color catalog describes the unit's advantages and method of operation.
Curtiss-Wright Corp.

29. Cycle controller

Bristol has released a 12-page bulletin, C311, on its improved impulse-sequence, time-cycle controller. It gives details on the controller, its applications, operation, and attachments.
Bristol Co.

30. Purifiers

Designed for those who need a complete catalog of purifiers, separators, mist extractors, and scrubbers is Anderson's new 8-page Bulletin 803. The brochure solves gas, air, steam and vapor entrainment problems by picturing and describing specifications and functions of practically every item in the purifier line.
V. D. Anderson Co.

31. Readout system

Multiple-pressure readout systems are the subject of a 12-page, 2-color catalog (No. 30 B1000). The system measures and records hundreds of different pressures simultaneously using a single high accuracy transducer.
Fischer & Porter Co.

32. Line pipe

A 40-page booklet describing the manufacture of steel line pipe has been published by Kaiser Steel Corp. Pipe covered: continuous weld from ½- to 4-in. in diameter; electric resistance weld from 4½ to 18 in.; and electric weld from 20 in. through 36 in. Also included is line pipe data tables showing weight per foot, wall thickness, test pressures, and tons per mile.
Kaiser Steel Corp.

33. Aluminumcase meters

Two light weight Aluminumcase meters, AL-175 and AL-250, are discussed in Bulletin 305. These domestic meters have a maximum working pressure of 5 psi. Operation, construction and specifications for both meters are presented in the new bulletin.
American Meter Co.

34. Crawler-tractor

Allis-Chalmers HD-6 diesel powered crawler-tractor is covered in Bulletin MS-1251. Pictures, graphs, charts bring up-to-the-minute information to the reader. Included are accessories designed and engineered for the HD-6.
Allis-Chalmers Mfg. Co.

35. Computer system

Installation and application of the Burroughs 205 electronic digital computer system in the petrochemical industry are covered in a new 14-page brochure. Subjects covered: exploration and production; manufacturing and refining; transportation and pipelines; and accounting and marketing.
Burroughs Corp.

36. Conversion table

A handy linear conversion table for converting inches and fractions of inches into decimal parts of a foot is available from Babcock & Wilcox. The table (TDC 110) has many uses besides its application to steel tubing.
Babcock & Wilcox Co.

37. Engine-compressor control

Control systems for completely automatic operation and protection of gas-engine compressors are covered in a new bulletin. Described is Ingersoll-Rand's Tendamatic control. The bulletin tells how it is applied for gas transmission and distribution uses.
Ingersoll-Rand

38. Orifice flanges

Detailed information on threaded, slip-on, and welding neck orifice flanges is in Bulletin 422 from American Meter. Specifications on welding neck orifice flanges are given for both raised face and ring joint models.
American Meter Co.

39. Packaged compressors

A 12-page bulletin describes Cooper-Bessemer's 9¾-in. bore by 10½-in. stroke V-angle compressor units for 440 to 1100-hp pumping services. Units come non-skidded or completely pre-piped and skidded.
Cooper-Bessemer Corp.

40. Pumping catalog

A 576-page catalog, "Pic-A-Pump," from Allis-Chalmers presents data arranged for easy selection of pumping units and materials of construction to meet specific applications. Hundreds of pump types, models, and sizes plus limitless capacities and almost any head conditions are presented.
Allis-Chalmers Mfg. Co.

41. Trip valve, regulator

Two new catalogs have been published. One, Bulletin 124, covers Type 299 pressure regulator for reducing applications. The other, Bulletin 170, covers Type 196 differential operated trip valves.
American Meter Co.

There is a Dresser®

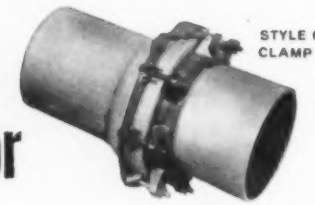
STYLE 38
6-BOLT COUPLING

pipe coupling,

fitting,

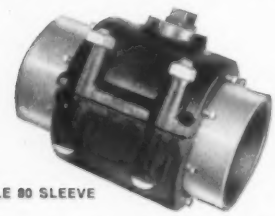
STYLE 90
STREET
TEE

repair clamp,



STYLE 60
CLAMP

or repair sleeve



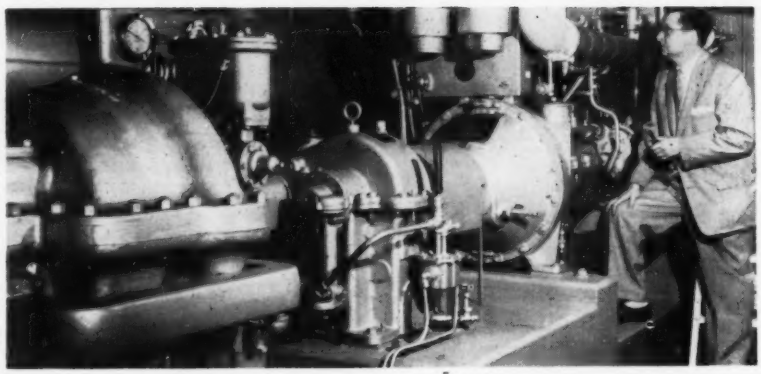
STYLE 80 SLEEVE

for every need

Only Dresser
manufactures a complete line.

DRESSER
MANUFACTURING DIVISION

Bradford, Pennsylvania



A unique water chilling machine, powered by natural gas, air conditions display areas of Milwaukee Gas Light Co.'s main office building. Replacing the usual electric motor or steam turbine power source, this centrifugal cooling unit is driven by a piston engine using natural gas as the fuel. Checking performance of the Waukesha engine powering the Carrier centrifugal refrigerating machine is Earl A. Tetting, building management superintendent. Cost of operation is comparable to other energy sources.

GAS • News Notes

Metropolitan Utilities District, Omaha, is planning to store 150,000 bbl of propane in underground storage. Propane will be used during peak periods of gas consumption. Total cost of the storage project, including cave and above-ground facilities, is $1.5 million.

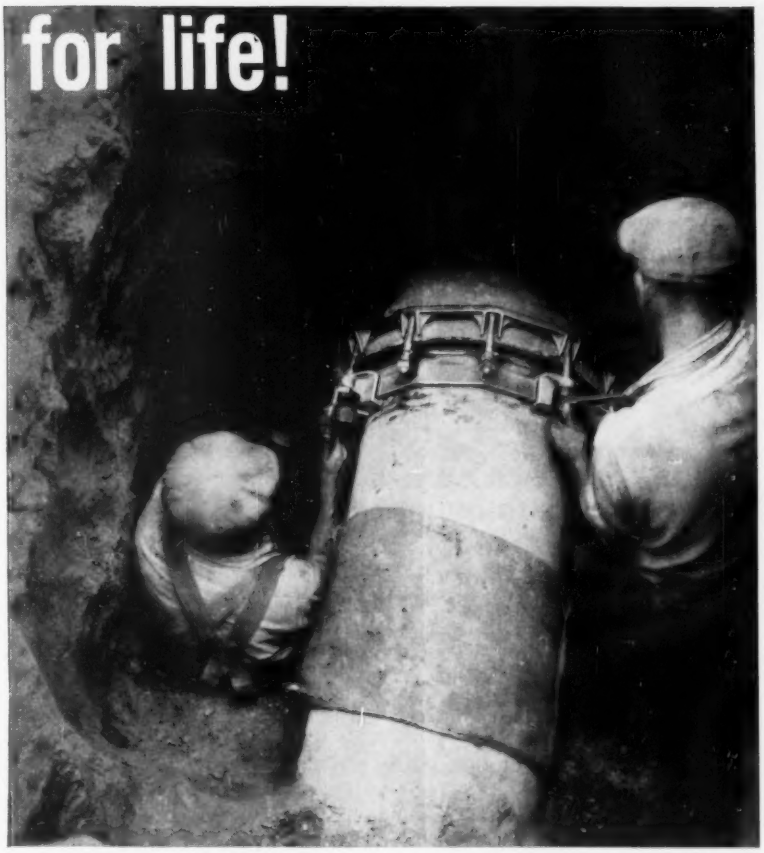
Atlas Valve Co., Newark, N. J., has appointed A. M. Seymour Associates, Rochester, N. Y., as sales representatives. The Seymour group will cover the western New York state area.

Welbilt Corp., Maspeth, N. Y., has bought Wedgewood - Holly Corp., Culver City, Calif. Wedgewood-Holly will continue to manufacture the Western Holly and Wedgewood line of ranges at its 300,000-sq ft plant. Henry Honer will continue as president of Wedgewood-Holly.

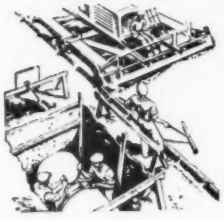
Exhibits of air conditioning and refrigeration equipment for use in business and industry will be held in Atlantic City on Nov. 2-5. The exhibits are part of the 11th Exposition of the Air Conditioning and Refrigeration Industry.

North Shore Gas Co., Waukegan, Ill. joined in its home town's centennial celebration this year with a parade float that sported a giant gas lamp and two regulation size lamps. The regulation lamps by Charmglow were operated on LPG. No gas was used in the big wood-and-paper lamp. A concealed floodlight provided light. Together with a heavy newspaper and radio advertising campaign, it was the nucleus of a summer gas light sales promotion effort.

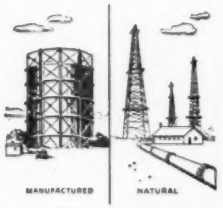
They're making this joint tight for life!



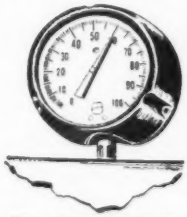
Last step in the installation of a Dresser Style 60 clamp . . . drawing up the bolts. Special-compound rubber gasket maintains gastight seal against caulking compound . . . lasts the life of your pipe. Write for illustrated brochure on the Style 60.



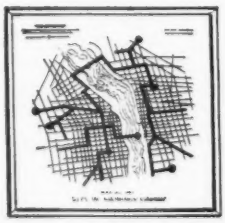
Ahead of Street Paving



When Switching from Wet to Dry Gas



When Boosting Pressure



In Progressive Maintenance Programs

Make clamping with the time-tested Dresser Style 60 standard practice

Rehabilitating and upgrading old cast-iron mains? Be *sure* of permanent joint tightness by using the time-proved clamping method and performance-proved Dresser "Adjustable" Style 60 Bell-Joint Clamps. You eliminate guesswork, and possible hazards.

Proved since 1901, when Dresser provided the first Bell-Joint Clamp, this mechanical, *positive* method for making bell-and-spigot joints gas tight has been approved by gas company operating departments everywhere. Thousands of miles of mains are giving renewed service at higher pressures, safely, after joint reinforcement with Style 60 Clamps.

Preventive maintenance is truly "preventive" when you clamp. Make doubly sure by making the Dresser® Style 60 *standard practice.*

Bradford, Pennsylvania
Chicago
Houston
New York
S. San Francisco
Toronto & Calgary

DRESSER MANUFACTURING DIVISION

ONE OF THE DRESSER INDUSTRIES

Hamer Valves Inc., Long Beach, Calif., has been bought by Chiksan Co., Brea, Calif. Hamer produces plug valves, gate valves, and line blind valves. Chiksan is a subsidiary of Food Machinery & Chemical Corp.

Field representatives from 14 U. S. and 2 Canadian cities attended General Controls Co.'s annual heating controls training course. The week-long session was held at the company's Glendale (Calif.) headquarters. The course is designed to introduce new heating control products and their uses as well as review products on the market.

New operating base for Southern Counties Gas Co's Orange county division is shown here in architects' rendering. Main office building is in center, storage and repair unit in rear, warehouse at right. Open area is for storage and parking.

THE *FINEST* FOR MODERN GAS DISTRIBUTION SERVICE

NORMAC

Insulating Couplings AND Fittings

Malleable Couplings

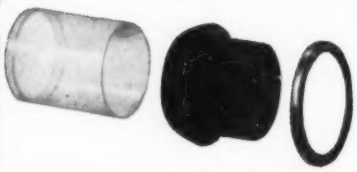
Normac Insulating Malleable Couplings and fittings are available with polyethylene inserts and semi-insulating gaskets or full insulating rubber gaskets.

Malleable Service Ell

The insulating principle depicted above is carried out in all Normac Ells and Tees.

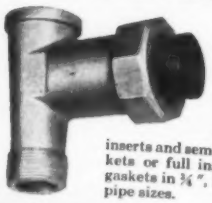
NORTON McMURRAY has specialized for 20 years in the development and production of products solely for the Gas Industry. Whether your plans include modernization, or new, expanded facilities, Normac Gas Distribution Equipment will serve you well.

Insulating Gaskets



The Normac insulating principle incorporates an efficient combination of a polyethylene sleeve and a semi-insulating gasket or full rubber gasket and retainer ring.

Brass Fittings



Normac insulating Brass compression end Tees, Ells and all compression end fittings are available with polyethylene inserts and semi-insulating gaskets or full insulating rubber gaskets in ¾", 1" and 1¼" iron pipe sizes.

New CATALOG

Write for your copy . . . it gives complete details and specifications of NORMAC equipment.

NORTON-McMURRAY Manufacturing Co.

919 North Michigan Avenue

CHICAGO 11, ILLINOIS

Couplings • Meter Bars • Sleeves • Cocks • Ball Joint Clamps • Service Tees and Ells

Kirk Industries Inc. has appointed Glenwood Range Co. as distributor for Kirk gas refrigerators in the six New England states. Glenwood's main offices are in Taunton, Mass. Offices and warehouses are maintained in Boston, Mass., and White Plains, N. Y.

Western Valve & Equipment Co. has been appointed to represent A. M. Byers Co. in western Canada and Lakehead territories. Western Valve has offices in Winnipeg.

New distributor of Hidy Brown degree day recorders is Malcolm Black & Co., Inc., New York.

Washington Natural Gas Co., Seattle, took third place in a competition among utilities for excellence of its annual report to stockholders. Public Utilities Advertising Association made the award.

Bucyrus-Erie Co.'s $12 million drill division plant at Richmond, Ind., has been named one of the nation's top 10 plants built in 1958. The Richmond facility was selected from more than 700 entries in the 25th annual "top plants" competition conducted by *Factory* magazine.

Southland Supply Co., Dallas, is distributing Byers polyvinyl chloride pipe for A. M. Byers Co., Pittsburgh.

GAS ASSOCIATIONS

Ligon heads AGA officer-nominees

Nominee for president of the AGA for the coming year is Wister H. Ligon, president of Nashville (Tenn.) Gas Co. Ligon is serving as 1st vice president.

Elections will be held at the Oct. 5-7 convention in Chicago.

Others nominated are L. T. Potter, president of Lone Star Gas Co., 1st vice president; E. H. Smoker, president of United Gas Improvement Co., 2nd vice president. Vincent T. Miles, treasurer, Long Island Lighting, was renominated for treasurer.

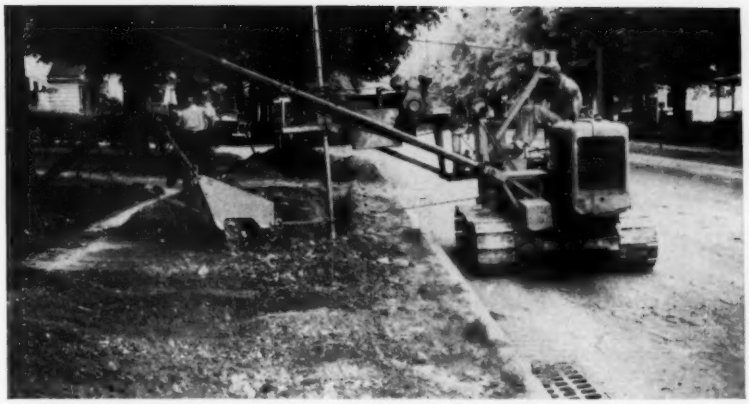
Up for directorships are: Wendell C. Davis, president, Cribben & Sexton; Buell G. Duncan, president, Piedmont Natural Gas; Robert E. Ginna*, chairman of the board, Rochester Gas & Electric; Elisha Gray II, chairman of Whirlpool Corp.; Hall M. Henry, president, NEGEA Service Corp.; John E. Heyke, president, Brooklyn Union Gas; Oakah L. Jones, vice president and general manager, Consumers' Gas Co.; Ralph T. McElvenny, president, Michigan Consolidated Gas Co.; S. Lloyd Nemeyer, president, Milwaukee Gas Light; Ed Parkes*, president, United Gas Corp.; John C. Parrott*, president, United Fuel Gas; N. R. Sutherland, president, Pacific Gas & Electric; S. D. Whiteman*, president, Kansas-Nebraska Natural Gas; and John H. Wimberly, president, Houston Natural Gas Corp. J. Theodore Wolfe, president of Baltimore Gas & Electric, and outgoing AGA president, becomes a director upon completion of this term as president.

* Renominated.

Industrial school set

Five days of intensive study are planned for the AGA's industrial gas school, Sept. 14-18, at the Penn-Sheraton hotel in Pittsburgh.

This year, lecturers will include specialists in sales, equipment, and heat processing operations from gas companies, industrial equipment manufacturers, and industrial gas consumers.

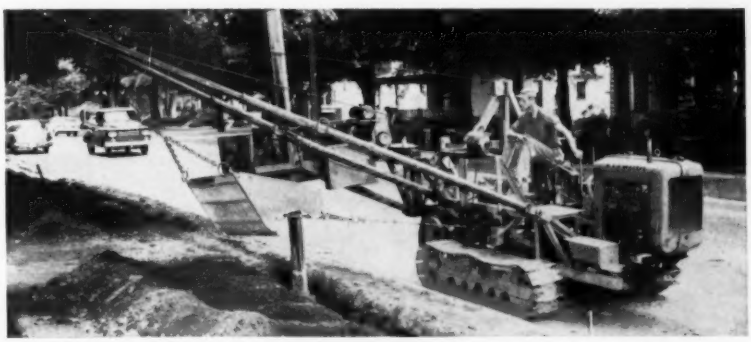


Job photos don't lie . . .

See from these photos how the Cleveland 80W's ability to pull backfill into trench permitted spoil to be placed off the street, away from the curb — no blocked-up catch basins, no need to lift backfill over curb, no interference with traffic (good public relations!). Note also how the one-man-operated 80W first backfilled and tamped driveways, making them ready for immediate use (more good public relations!) then backfilled and tamped the rest of the trench.

but they tell only part of the CLEVELAND 80W story

But you've got to see the 80W in action to really appreciate it—a cost-cutting versatile machine that fits so many different underground construction jobs. It handles and lays pipe—sets valves and hydrants—pulls street crossings—backfills fast *from either side* of trench, toward or away from itself—simultaneously tamps fill to the most rigid specifications—does a complete clean-up job.



The CLEVELAND TRENCHER Co.

20100 ST. CLAIR AVE. • CLEVELAND 17, OHIO

Good Everywhere

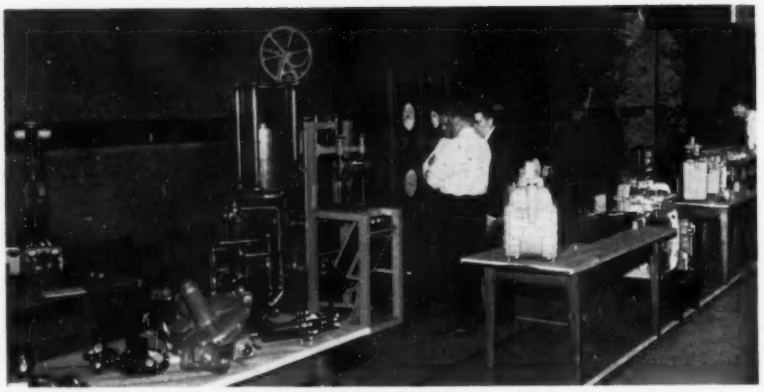
GAMA members join boiler division

Three long-time members of GAMA have been elected to membership in the gas boiler division.

They are All American Metal Products Co., Philadelphia; Laars-Engineers, North Hollywood, Calif.; and Rheem Manufacturing Co., Chicago.

CNGA names new officers

K. C. Vaughan, manager of the natural gasoline and gas department of Union Oil Co. of California, is the new president of the California Natural Gasoline Association. Retiring president is H. J. Maxwell, Standard Oil Co. of California. Newly elected vice president and advisory committee chairman is J. A. Smith, superintendent of gas and gasoline plants, Texaco Inc.



Forty-one companies exhibited at the 3rd gas measurement and control school at Worcester Polytechnic Institute. A record group of 156 was reported for the school, sponsored by the operating division of the New England Gas Association. Much of the equipment—including cut-away regulators, meters, telemeters, computers—was on display in New England for the first time.

Safety conference slated for September

Atlanta, Ga. is the site of the gas industry's 11th annual accident prevention conference. The two-day session, Sept. 15-16, is co-sponsored by AGA's accident prevention committee and the accident prevention council of the Southern Gas Association.

A special feature of the conference at the Dinker-Plaza hotel will be a workshop for corporate officers on the theme "Top management looks at accident prevention." L. T. Potter, chairman of AGA's executive safety committee, will moderate.

Welcoming conference delegates will be Atlanta Gas Light Co. president R. G. Taber. Keynote speaker is J. M. Wilson, vice president of United Gas Corp.

The first session will see presentation of safety awards to companies which had the greatest improvement in employee safety during 1958.

ARE YOU SURE YOUR SYSTEM IS INSULATED?

IT'S EASY TO

check for shorts with the NEW

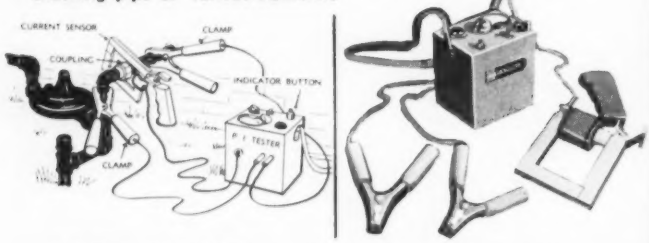
Good-All

PIPE INSULATOR TESTER

SIMPLE • FOOLPROOF • ACCURATE

In a few minutes anyone can be taught to use the P. I. Tester and can check dozens of unions or flanges in a day. It will quickly pay for itself in man-hour savings and system improvement. The P. I. Tester will accurately check insulators in gas service entrances, oil field flow lines, refinery piping or other piping systems where alternate current paths make other methods of checking insulators unreliable.

FEATURES: Transistorized amplyfying circuit • Light, compact, rugged • Easy to read meter • Basic unit takes accessories for checking pipe of various diameters



Ask Your Good-All Representative For A Demonstration

GOOD-ALL ELECTRIC MFG. CO.

ELECTRICAL MECHANICAL DIV. OGALLALA, NEBRASKA

Third textile symposium planned by AGA and SGA

The third annual Textile Processing Symposium will be held Sept. 28-29 at the Sedgefield Inn, Greensboro, N. C. Co-sponsors are the American and Southern Gas Associations.

Subjects on the program include textile plant design, non-woven fabrics, textile air conditioning, machinery for the textile industry, foreign competition, application processes for textile resins.

Paper-gas industry symposium offered

The first paper industry heating and drying symposium sponsored by the AGA and the Ohio section of the Technical Association of the Pulp and Paper Industry will be held on Sept. 15. Meeting place is the Manchester hotel, Middletown, Ohio.

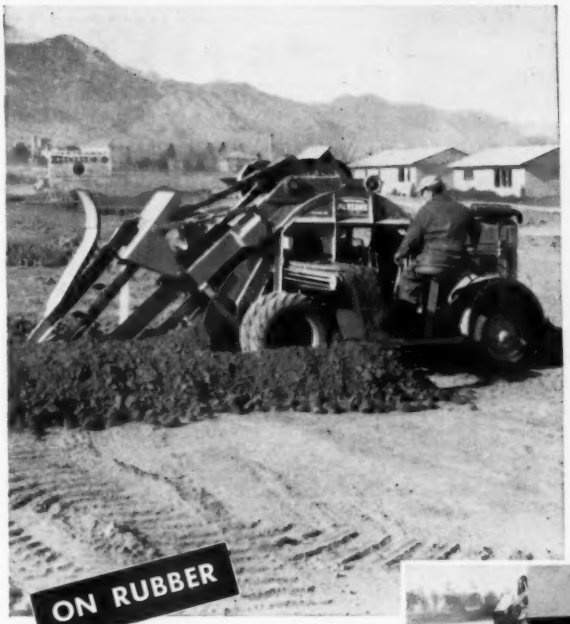
The opening meeting of the 1959-1960 series will be devoted to the gas industry as it affects pulp and paper processing operations.

corrosion • *Continued from page* 19

potential along the line, which was comparatively low.

The test was then repeated from the other end of the line, with results which were not much better, but were very different. This time the total current demand was lower, but the attenuation of potential was more rapid, the response at the most distant end—where the first test was run—being virtually zero.

Finally a most unexpected solution was found. From the abandoned steel pole, an unexpected conduit ran to a pumphouse, where it made contact, not only with other conduit, but with the pipe itself. Consequently, a large part of the current flow in the first test had actually been flowing in a closed circuit, and the feeble response of the line was really an acceptably good response to a small current. In the second test, the unsuspected load on the system made the attenuation apparently much worse than its correct value. When the offending conduit was cut, a repeat of the first test did more with *three* amp than had been accomplished with *fifteen!* ■



NOW PARSONS® brings you a pair of small utility trenchers

ON RUBBER

Mobile as a truck, Parsons 88 Trenchmobile® steps up work schedules on widely scattered jobs. It drives around town from one assignment to the next at speeds to 12.6 m.p.h. On house-to-street service connections, pipeline reclamation, or mainline extensions, the 88 opens up to 14½ feet of trench per minute, 8 to 16 inches wide at depths to 5 feet. Positive down-crowd boom starts cut fast, holds accurate grade. It undercuts walks, curbs, cross-pipes — makes vertical set-ins. But that's not all, on many jobs, Parsons Trenchmobile — equipped with 6-foot blade (optional) — backfills its own trench.

ON CRAWLERS

Parsons little 77 Trenchliner® is not much wider than a yardstick, just 3 feet-10 inches wide to be exact. What's more it's only 5 feet-8 inches "low" with the boom in digging position. Weighs about 6700 lbs. for convenient trailer transport from job to job. Small in size but big in capacity, the 77 produces from 4.4 inches to 21 lineal feet of trench per minute, 6 to 18 inches wide, at depths to 5 feet. Its self-cleaning buckets are equipped with Parsons "Tap-In" teeth. Shiftable spoil conveyor is instantly reversible for controlled discharge. Better check what these small utility Trenchliners can do on your service lines, mainline extensions, etc. Ask your local Parsons distributor for a demonstration on your work, or write for literature.

Want more facts?

Mail to: PARSONS Company, Newton, Iowa (Division of Koehring Co.)

Send literature on: ☐ 88 Trenchmobile ☐ 77 Trenchliner

NAME..... TITLE.....

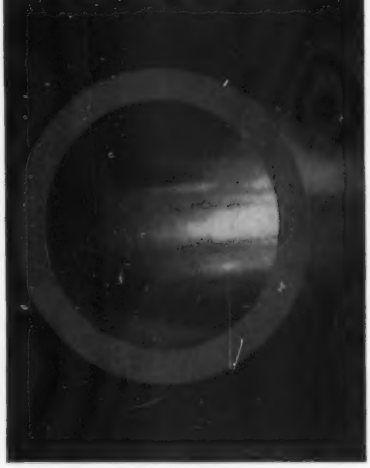
COMPANY..... DIV.....

STREET.....

CITY..... STATE..... P920 GAS

quality pipe from a quality producer

Byers PVC Pipe scotches corrosion



where to use it:
underground mains/service lines

why Byers PVC Pipe?

- no underground corrosion
- no protective wrappings needed
- no cathodic protection needed
- easily threaded, socket cemented and heat welded
- non-flammable
- does not attract rodents

Note: high tensile strength of PVC Pipe allows higher working pressures than any other plastic pipe economically competitive in this service.

Clip coupon for new PVC Pipe Catalog

A. M. BYERS COMPANY
Dept. A-9, Clark Bldg.
Pittsburgh 22, Pennsylvania

Name_____

Title_____

Company_____

City_____ Zone___ State_____

GAS • PEOPLE

HERBERT D. CLAY was elected president of Iroquois Gas Corp., Buffalo, N. Y. succeeding Stuart H. Nichols, recently elected president of National Fuel Gas Co. Clay became associated with the National Fuel family in 1933. He joined Iroquois in 1946 as an engineer. In 1952 he became chief engineer, in 1953 vice president, and in 1957 executive vice president. LOUIS R. REIF, a vice president of Iroquois, was elected a director of the company.

Herbert Clay
Iroquois

James Williams
Oklahoma Natural

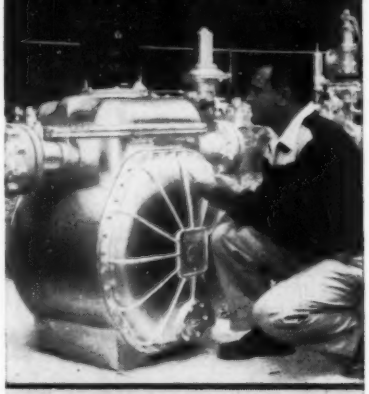
JAMES W. WILLIAMS is Muskogee district operating superintendent of Oklahoma Natural Gas Co. Williams succeeds W. G. VANARSDALE, who has retired after 38 years with Oklahoma Natural.

EBEN WRIGHT PYNE has been elected a director of Long Island Lighting Co., Mineola, N. Y. Pyne, president of the First National City Trust Co., replaces LEE P. STACK, who has been a director of LILCO since 1951.

JOHN R. RILEY was promoted to supervisor of sales and service for the Pittsburgh division of Peoples Natural Gas Co. He will headquarter at the company's Wilkinsburg sales office.

ANTHONY B. YOUNG has been named advertising manager of the Peoples Gas Light & Coke Co., Chicago. He succeeds RAYMOND W. FENTON, who has retired after nearly 36 years of service with Peoples Gas. Young, with Peoples Gas for 19 years, most recently served as assistant advertising manager.

FOR ACCURATE FLOW MEASUREMENT
365
DAYS A YEAR



USE AMERICAN® BASE VOLUME AND BASE PRESSURE INDEXES

American BASE VOLUME INDEXES register gas quantity at standard conditions of base temperature and base pressure. BASE PRESSURE INDEXES automatically multiply volume at line conditions by the pressure factor and indicate quantity at base pressure on a straight reading index.

No computations...accurate gas volumes at base conditions are shown immediately. A second counter on the back indicates volume at line conditions. Simple operating principle... integration is continuous with all functions performed mechanically through special gearing.

Write for Bulletins 200 and 201.

AMERICAN® METER COMPANY
INCORPORATED (ESTABLISHED 1836)
General Offices: Philadelphia 16, Pa.
Sales Offices in Principal Cities

WILLIAM GASKELL is central district manager for the American-Standard Air Conditioning Division. He will be in charge of an area running from Michigan to eastern Tennessee, including upper New York state and the western half of Pennsylvania.

JOHN K. TOLFORD, executive vice president and general manager of Citizens Gas Fuel Co., Adrian, Mich., has been elected president. He succeeds E. V. GMEINER. Gmeiner is retiring after serving as president since 1939. He will continue as a consultant, director, and member of the executive committee. ROBERT NYSTROM, distribution superintendent for the past three years, has been promoted to general superintendent.

Oronite Chemical Co., San Francisco, has reorganized its development activities, including creation of a new commercial development department. Heading the new department is Dr. R. I. STIRTON as general manager. Other appointments include Dr. W. E. ELWELL as manager, market development; K. J. VAN ARNUM, manager, market research; and R. E. ECHOLS, supervisor, market development.

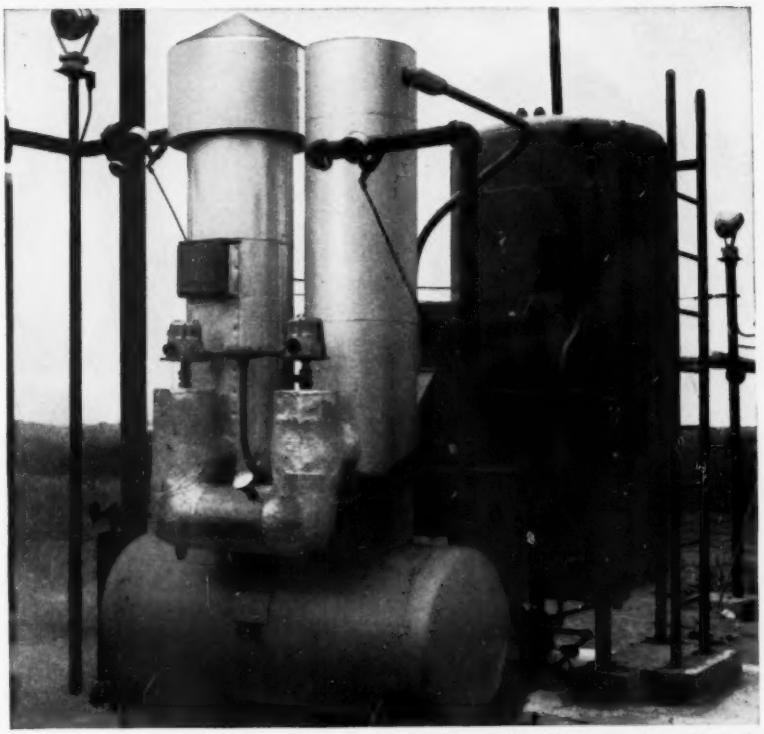
JOHN A. SHEAHAN has retired after nearly 30 years of service with Atlanta (Ga.) Gas Light Co.

JACK Y. ALDRICH has been named branch office manager of the San Antonio (Texas) office of the Burroughs Corp. He formerly was manager of the Amarillo office.

JAMES H. SATTERWHITE, president of American Meter's Westcott & Greis division since 1950, is retiring. Satterwhite joined Westcott & Greis in 1917 as general manager. He continued in that capacity after American Meter acquired the company in 1932. From 1911 to 1915, Satterwhite was with Peoples Natural Gas Co., Pittsburgh. In charge of experiments vital to the development of the orifice meter, he directed the company's Wilkinsburg test station.

Four top executives of Stone & Webster Engineering Corp. have been elected vice presidents. They are HAROLD F. CLEARY and DONALD N. MCCORD, construction managers; M. H. CUTLER, engineering manager; and WILLIAM R. PRANG, West Coast district manager.

FOG TO PROTECT GAS DISTRIBUTION SYSTEMS



The Koppers-Baltimore electric Oil Fogger, 100 gallon capacity, newly installed at the East Rutherford Natural Gas Metering and Regulating station—the Public Service Electric and Gas Company, Newark, N. J.

FOG TO REDUCE "UNACCOUNTED FOR"

By introducing a fine oil mist into gas mains, Koppers Oil Foggers reduce maintenance of meters and regulators; safeguard main joints; reduce leakage; solve dust problems; reduce service calls.

A single unit can service several gas distribution pressure systems. Koppers Oil Foggers are easily maintained, safe and are built to last.

Koppers has been producing equipment for the gas industry for more than 80 years. To find out how you can benefit from this broad experience . . . write today to: KOPPERS COMPANY, INC., Gas Apparatus Dept., 2009 Scott Street, Baltimore 3, Maryland.

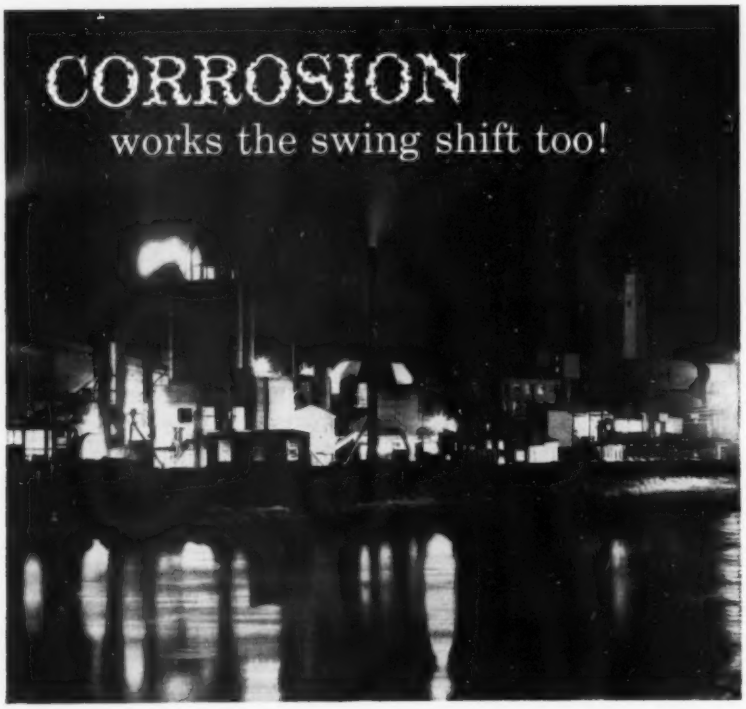
FOG TO CONTROL DUST PROBLEMS

KOPPERS

GAS APPARATUS

Designers and builders of Gas Holders

Inspection, repair and service of Gas Holders



Thousands of miles of underground pipe feed natural gas to factories . . . other pipelines distribute oil and other petroleum products. And every foot . . . every inch . . . could corrode and leak anytime, day or night.

Electro Rust-Proofing can assist in the big job of corrosion control. Assist with surveys, design recommendations and actual installation of corrosion control systems.

Even if you have your own corrosion engineering group, ERP can swing extra manpower and engineering experience onto rush jobs—supplement your own team on the special problems.

For full information on ERP Pipeline Corrosion Control, Write Dept. E-52.41.

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A SUBSIDIARY OF WALLACE & TIERNAN INC.
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SAFETY GAS MAIN STOPPER CO. INC.

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GEORGE A. SAAR has been appointed assistant to J. L. SINGLETON, vice president of the Industries Group, Allis-Chalmers Manufacturing Co., Milwaukee.

JOHN E. FARRAND has been appointed general manager, International Division, Robertshaw-Fulton Controls Co. He will head Robertshaw's international operations with the exception of those in Europe. Farrand will headquarter in Richmond, Va.

HAROLD C. CONNAL has been named southern division manager for Southern California Gas Co. He replaces PAUL W. WALTERS, who has given up the post because of illness. Walters has been manager of the division since 1944. Currently, Connal is superintendent of customer service for the central division.

Harold Connal
SoCounties

Harold Wahl
American Meter

HAROLD W. WAHL is manager of American Meter Co.'s Southwest division. Since 1950, Wahl has been manager of the southern division of Westcott & Greis Inc., an American Meter subsidiary recently incorporated into the company's Southwest division. Wahl headquarters in Dallas.

Honolulu Gas Co. has made several changes in its sales organization. WILLIAM HAXTON transferred from managership of the Maui Island branch to manager of merchandise sales in Honolulu. WALLACE OI is manager of the Maui branch. DALE TEET is assistant to the general sales manager, HOWARD MAGNUSON, in Honolulu. JAMES PUTNAM is the newly appointed manager of gas sales in Honolulu. ANGELINE GOMES is office manager and prospect coordinator of the distribution plant.

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REYNOLDS GAS REGULATOR

...IT'S RIGHT FOR THE JOB!

REYNOLDS GAS REGULATOR CO., INC.

ANDERSON, INDIANA. *A Subsidiary of Arkansas Louisiana Gas Company*

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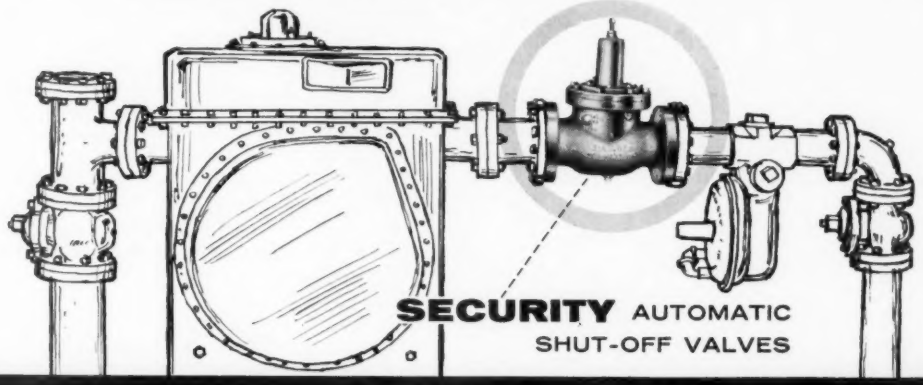

SECURITY AUTOMATIC SHUT-OFF VALVES

A typical industrial installation

Model "IP-H" (closes on Increase of Pressure, High pressure application) shown above. POSITIVE, ECONOMICAL, EASY TO INSTALL. Write for catalog on complete line of Automatic Shut-off Valves.

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Nothing Beats It For Fast, Low Cost Digging

Here's a front and rear view of the more powerful, compact 4T Vermeer Pow - R - Ditcher in action. If you are looking for a low cost, rugged, time - saving ditcher, take a look at the 4T before you buy.

Vermeer Model 4T POW-R-DITCHER

This rugged, self - propelled Pow - R - Ditcher is only 48" wide, 6' high and 13' long and can be transported in a pickup truck. A "midget" ditcher that is ideal for laying gas, water and narrow service lines. The 4T is highly maneuverable — digs 6" to 14" wide and down to 4½' deep.

WRITE FOR COMPLETE INFORMATION, LITERATURE AND LOW PRICES ON THE COMPLETE POW-R-DITCHER LINE.

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- Greatest depth penetration
- Greatest tracing distance
- Pinpoint accuracy
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- Built-in battery testers
- 90% less maintenance costs

Built for rugged field use; Transistorized circuits, compact fiberglass case.

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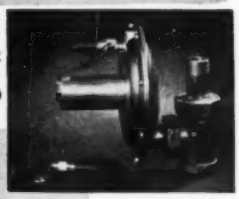
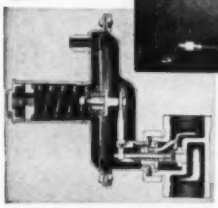
Dept. G-3, Palo Alto, Calif.

UNIVERSAL

GAS SERVICE REGULATORS FOR CONVERSION OR PRESSURE ELEVATION

A REGULATOR, BREATHER VENT AND CATHODIC INSULATOR IN ONE PACKAGED UNIT





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EXCLUSIVE FEATURES NOT FOUND ELSEWHERE!

Exceptionally high relieving capacity obtained by new type internal relief valve. Remarkable by-pass check valve prevents over-shooting of low pressure and damage to meter.

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E. G. Reynolds
MichCon

C. E. Baker
Reynolds

CLARENCE E. BAKER has been named coordinator of sales of Reynolds Gas Regulator Co. Inc., Anderson, Ind. Before his recent appointment, Baker was eastern regional sales manager for Arkla Air Conditioning Corp., Evansville, Ind.

EDWARD A. FEHLBAUM has been appointed manager of European operations by White-Rodgers Co., St. Louis. Headquarters for the company's European operation are in Basel, Switzerland.

W. M. LITTLE has been appointed vice president and manager of operations for North Carolina Natural Gas Corp. He will headquarter in Fayetteville. Before joining NC Natural, Little was project engineer for R. A. Ransom Co. Inc., builder of the gas company's pipeline system.

ELLSWORTH G. REYNOLDS has been elected a vice president of Michigan Consolidated Gas Co., Detroit. Reynolds joined Michigan in 1948 as legal and administrative assistant to the secretary. He became an assistant secretary in 1952 and was elected secretary in 1953.

Four new sales representatives were appointed by American-Standard Air Conditioning Division. They are (from left): John Slein, New England area; Jan Winter, Midwest district; Bill Gregory, Wisconsin-Illinois territory; and Joel Leeson, northern New Jersey and Westchester county and Long Island, New York.

Harold Proske
Rockwell

Joseph Potts
Bonney Forge

HARRY S. WALKER has been named to the newly created post of director of sales for Caloric Appliance Corp., Jenkintown, Pa. With Caloric since 1952, Walker served as a sales representative and sales manager in the southwestern division before becoming sales promotion manager.

Northern Ontario Natural Gas Co. Ltd., Toronto, has appointed E. C. BOVEY vice president and A. HOVE vice president and chief engineer. Hove joined Northern Ontario in February 1958 as chief engineer. Bovey joined the company at the same time as assistant to the president.

HAROLD O. PROSKE, director of sales aids and training, is now Shreveport (La.) branch manager of Rockwell Manufacturing Co.'s Meter and Valve division. With Rockwell since 1938, Proske has served as sales engineer, service manager, assistant sales manager —gas products, and national representative of the gas products division.

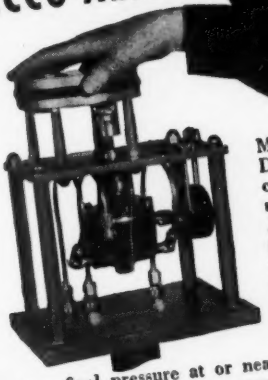
JOSEPH M. POTTS is the newly elected president of Bonney Forge & Tool Works, Allentown, Pa. and Alliance, Ohio. Prior to his election, Potts served as vice president of Bonney and general manager of its Allentown operations.

EDWIN T. GOREE has been appointed vice president in charge of sales for the Koehring Division of Koehring Co., Milwaukee. Before joining Koehring, Goree was sales manager of commercial crane and excavators for Bucyrus-Erie Co.

GEORGE KOVAC has been appointed administrative coordinator of the gas utility department of Norge Sales Corp., Chicago. He replaces WILLIAM GOLDING. Kovac has been with the Norge field sales group as a field merchandiser.

ARCCO

ARCCO-Anubis CONTINUOUS GAS SAMPLER



MEETING THE DEMAND for more accurate gas sampling, this newly perfected ARCCO-Anubis instrument replaces inadequate, inaccurate spot sampling methods. The Model 100-7 will over a period of seven days accumulate at a constant rate a sample of gas to a final pressure at or near 100 psig from a sample source, the minimum pressure of which is not less than 125 psig.

The ARCCO-Anubis design is based on the principle that maintenance of a constant rate of increase in gas pressure within a closed container, from zero to any selected maximum pressure, will result in a continuous rate of flow of gas into the closed container.

This is accomplished by means of a specially designed regulation system equipped with a precision drive mechanism so as to obtain a constant predetermined rate of increase in the outlet pressure into the sample container.

Send for Bulletin No. 112-R1

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7142 E. Condor St. • Los Angeles 22, Calif.

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MR. PRESIDENT...

You've heard it said many times that "What the gas industry needs is a trade character" . . . a character who can help in the highly competitive battle for the consumer's fuel dollar. Here's our candidate: Speedy Therm. He can't possibly be mistaken for a drop of water, oil, puffed rice or anything else, because he has G-A-S written all over his face. And Speedy brings you a monthly service featuring hundreds of drawings in a wide variety of poses. Hire Speedy Therm *now* to help your company in the battle of fuels.

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SPEEDY THERM SERVICE COMPANY
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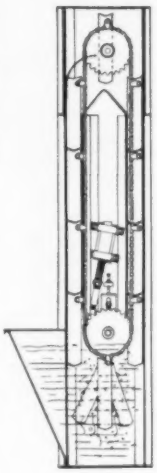
SELF-CLEANING AIR FILTER

automatic rotating double-wall panel curtain available with air or electric drive.

The panels in the Automaze curtain type filter are cleaned and recharged automatically with adhesive. A rotating curtain that holds individual panel filters submerges the panels in an oil reservoir on a timed cycle to dislodge and deposit accumulated dirt in the reservoir. As a result, the Automaze stays clean indefinitely to maintain uniform air flow.



Automaze goes 3 to 6 months without attention, a major improvement over stationary filters that normally need cleaning once a month. Only servicing needed is to remove sludge every six months.

Where compressed air is available, Automaze can be furnished with pneumatic drive. Electric drives are available for standard line current specifications. **AIR-MAZE CORPORATION,** Cleveland 28, Ohio.

R. H. Herbst (right) is the new general sales manager of Quick-Way Truck Shovel Co., Denver, according to Gilbert S. Rigdon (left), executive vice president of the company. Herbst succeeds T. S. Petersen, who resigned.

STUART H. NICHOLS has been elected president of National Fuel Gas Co. He succeeds WILLIAM H. LOCKE, who is retiring after serving as president since 1955. Nichols is currently president of Iroquois Gas Corp., Buffalo, N. Y. He has been a director of National Fuel since 1950, vice president since 1955. DONALD E. CONAWAY was elected vice president of the parent National Fuel to succeed Nichols. Conaway is president of Pennsylvania Gas Co., a subsidiary.

D. REX SCOTT has been named general manager of Robertshaw-Fulton Co.'s Western Research Center in Anaheim, Calif. Scott has been assistant general manager since early this year. He succeeds THOMAS H. JEFFERS, who is now director of facilities and tooling, West Coast operations. In other appointments, WILLIAM D. STEELE has become director of planning for Robertshaw. Steele, former district sales manager in the eastern states for the Grayson Controls division, will headquarter in Richmond, Va.

Manager of A. O. Smith Corp.'s new Newark, Calif., plant is DON HARTQUIST, former plant engineer at Kankakee . . . New chairman of the board of Reilly Tar & Chemical Corp. and Republic Creosoting Co. is CARLETON B. EDWARDS. President is PETER C. REILLY.

Continued on page 114

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SEALING COMPOUNDS

Heat and vibration-proof, non-solvent, will not shrink, crack or crumble. Makes all assemblies leak-proof and pressure-tight. Prevents rust, corrosion, joint seizure.

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LIQUID WRENCH®

The super-penetrating rust solvent

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rusted bolts, nuts, screws, 'frozen' parts

Liquid Wrench works *fast*... yet is absolutely safe for all metals and alloys.

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At Industrial, Automotive, Hardware, Plumbing Jobbers

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"W" Type Survey for downtown and commercial areas

includes street and building inspection. This Heath Leakage Control Survey accurately locates and classifies gas leakage. It reduces unaccounted for losses and gives the obvious advantage of a 3rd party Audit of your leakage situation.

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Write for information about a Heath Survey of your properties.

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Survey Consultants, Inc.

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GAS CALENDAR

September

9-11..Pacific Coast Gas Association Annual Meeting—Ambassador Hotel, Los Angeles.
11..New Jersey Gas Association Annual Meeting—Essex & Sussex Hotel, Spring Lake, N. J.
11-12..Maryland Utilities Association—Virginia Beach, Va.
14-18..AGA Industrial Gas School—Penn-Sheraton Hotel, Pittsburgh.
15-16..AGA Accident Prevention Conference—Dinkler Plaza Hotel, Atlanta, Ga.
17-18..AGA Great Lakes Public Relations Workshop—Dearborn Inn., Dearborn, Mich.
18..Oklahoma Utilities Association Gas Division Conference—Biltmore Hotel, Oklahoma City.
24..NEGA Safety Conference—Sheraton Plaza, Boston

October

5-7..American Gas Association Annual Convention—Conrad Hilton Hotel, Chicago.
8-9..California Natural Gasoline Association Annual Fall Meeting—Huntington-Sheraton Hotel, Pasadena.
13-14..Gas Measurement Institute—National Guard Armory, Liberal, Kan.
14-16..Wisconsin Utilities Association Operating & Sales Convention—Shroeder Hotel, Milwaukee.
26-27..Independent Natural Gas Association of America Annual Meeting—Westward Ho Hotel, Phoenix, Ariz.
29-30..Oil Recovery Symposium on Southwest Texas (Sponsored by Southwest Section of AIME and Texas Petroleum Research Committee)—Driscoll Hotel, Corpus Christi, Texas.

February 1960

29-Mar. 2..AGA General Management Section Conference—Pittsburgh-Hilton Hotel, Pittsburgh, Pa.

March

14-18..National Association of Corrosion Engineers Annual Convention—Dallas.
21-23..Mid-West Gas Association Annual Meeting—Hotel St. Paul, St. Paul, Minn.
24-25..New England Gas Association Annual Meeting—Hotel Statler, Boston.
30-April 1..GAMA Annual Meeting—The Greenbrier, White Sulphur Springs, W. Va.

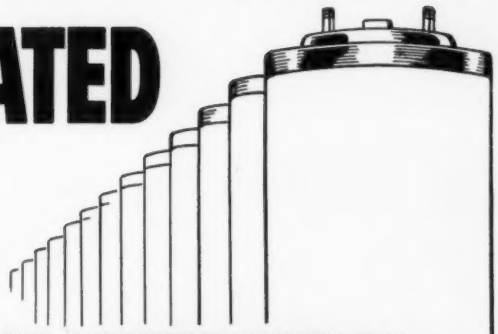
April

20-22..Indiana Gas Association—French Lick-Sheraton Hotel, French Lick, Ind.
25-27..Southern Gas Association Annual Convention—Galveston, Texas.

May

9-13..AGA Operation Section, Joint Distribution and Transmission Conference—Hotels Roosevelt and Jung, New Orleans.
16-18..AGA-Mid-West Regional Gas Sales Conference—Edgewater Beach Hotel, Chicago.
23-25..AGA Operating Section Production Conference—Hotel Roosevelt, New York.

ONLY THE FINEST WATER HEATERS ARE PERFORMANCE RATED



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FINEST NAME IN PLUMBING AND HEATING

- With Performance Rating you easily match your customer's needs to the right size "rated" water heater.
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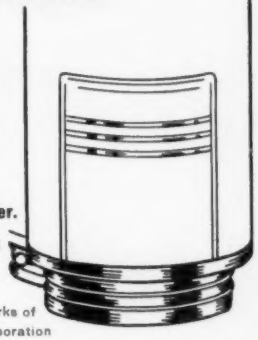
- Glass-lined or galvanized steel tank; 20 to 65 gallons; full price range.



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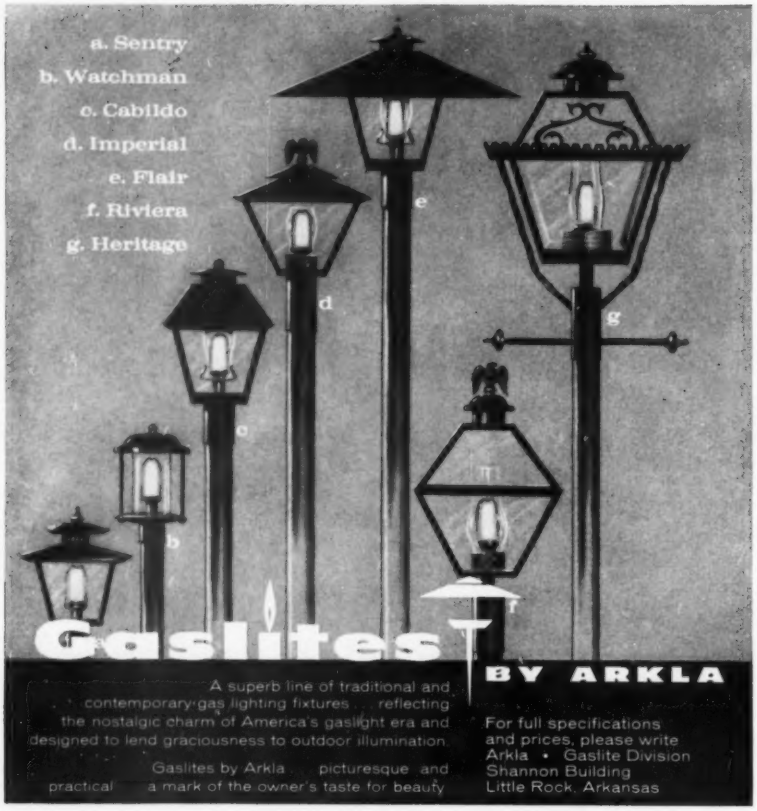
PLUMBING AND HEATING DIVISION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people • *Continued*

from page 112

WESLEY A. SONGER is the newly elected executive vice president of Crane Co., Chicago . . . Bailey Meter Co., Cleveland, has named J. W. CUNNINGHAM manager of the company's Atlanta (Ga.) district office. He succeds M. J. MCWHORTER, retiring after 38 years with Bailey . . . HERBERT T. BLOOD is a new insurance consultant with Commonwealth Services Inc., New York . . . General manager of Babcock & Wilcox Co.'s refractories division is ROBERT A. BARR.

THADDEUS J. KUSTO is director of research for Computer Systems Inc., New York, and MILTON M. GERBER is chief engineer . . . Project leader in the engineering labs of Cribben & Sexton is IRVING L. BELINKOFF . . . JOHN I. TRIMBLE is general manager of the Janitrol Heating & Air Conditioning Division of Surface Combustion Corp., Columbus, Ohio.

ANDREW L. EAVAS is assistant advertising manager of Cribben & Sexton Co., Chicago . . . EDWARD J. KANKER has retired after 22 years with Norge division of Borg-Warner Corp. He served as gas range sales manager and assistant to the president . . . ALFRED L. PATMORE has been promoted to patent counsel of Surface Combustion Corp., Columbus, Ohio.

Deaths

HUGO W. WAHLQUIST, 63, corrosion engineering consultant with Ebasco Services Inc., died recently in New York. Mr. Wahlquist was well known in the engineering field as an authority on problems of corrosion mitigation. He was the author of many technical papers, and holder of patents on several developments in the engineering field. He also conducted extensive research on paints and other protective coatings, and pioneered various methods and procedures to overcome the effects of corrosion.

The R. W. STAFFORD CO.
GAS CONSULTANTS—ENGINEERS—CONSTRUCTORS
Natural Gas Conversions
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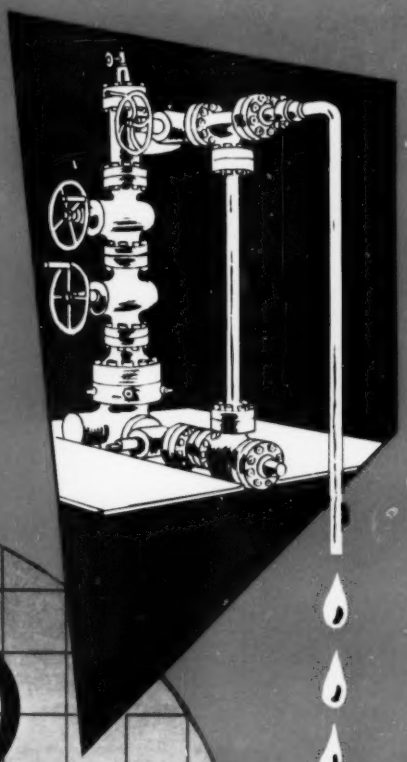
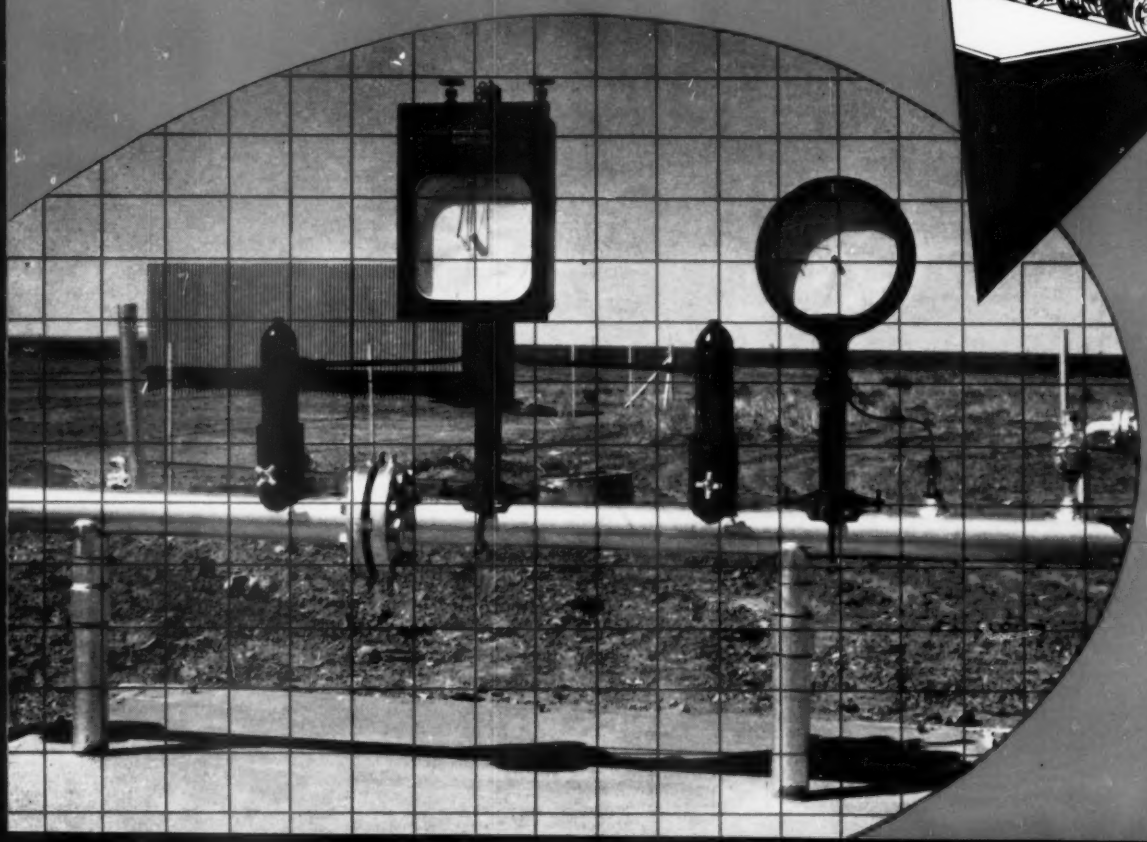
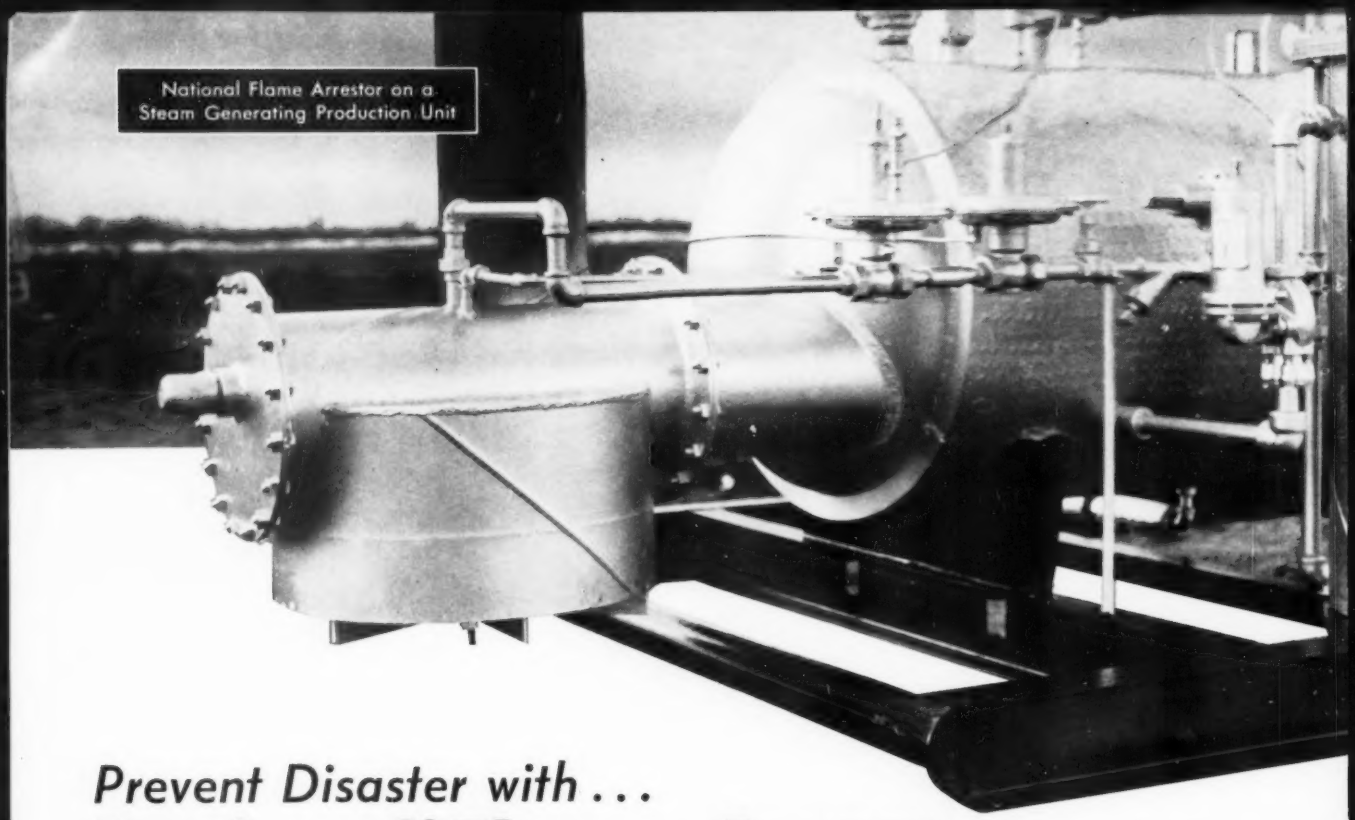
GAS

PIPELINE SECTION

Measuring wet high pressure gas with bellows-type orifice meters







National Flame Arrestor on a Steam Generating Production Unit

Prevent Disaster with . . .

National® Flame Arrestors

PROTECT LIFE AND PROPERTY ON YOUR LEASE!

❶ Stops all flame propagation outside of the firetube on which the unit is installed.

❷ Withstands any explosion inside the tube.

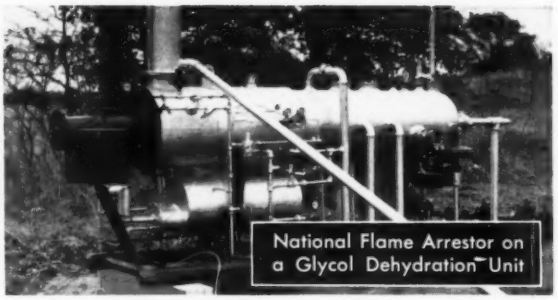
❸ Prevents any flash from going through the element.

❹ Welded, heavy steel construction. (No castings to crack in case of rapid or uneven cooling in event of rain, snow, sleet, etc.)

The National-designed Arrestor has been field and laboratory tested, proven, accepted and in use over a long period of time under extreme climatic conditions; in service on offshore platforms in the Gulf Coast with hurricanes, rain, wind and salt spray; in service in Canada where temperatures drop to −50° F with snow, ice and wind.

Available in two types for installation on all existing fired production units. Both types can be supplied with push-button pilot lighters or the automatic robot pilot.

A. The push-button pilot lighter in conjunction with the arrestor enables the lease operator to manually light the pilot in the firetube with no danger of flash back or explosion.



National Flame Arrestor on a Glycol Dehydration Unit

B. The automatic robot pilot will automatically light the pilot with no attending personnel and will automatically shut off the gas supply in case of failure of any part of the burner system.

Install National Flame Arrestors on existing equipment and specify National Flame Arrestors on all future purchase of field equipment to insure maximum safety for life and property.

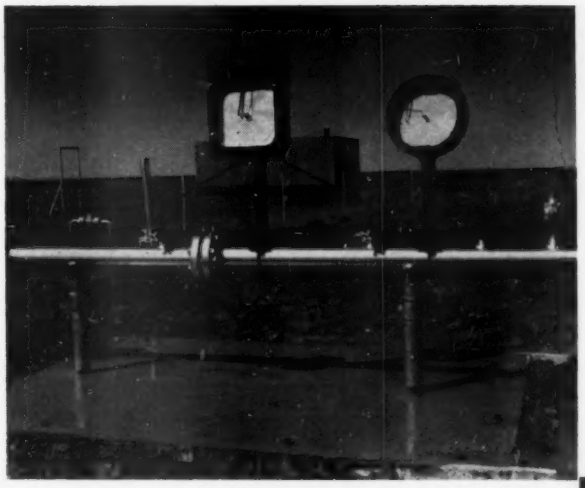
THE NATIONAL FLAME ARRESTOR CONTAINS THE PROPER ARRANGEMENT OF ALL NECESSARY COMPONENTS TO MAKE A PERFECT ARRESTOR — ANY LESS IS POSITIVELY INADEQUATE AND DANGEROUS . . .

It's a National®

NATIONAL TANK COMPANY

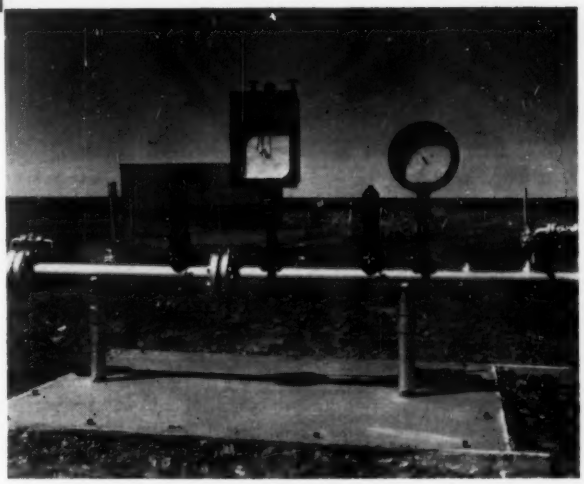
DRAWER 1710

TULSA, OKLAHOMA



GAS exclusive

Meter manifolding before (left) and after (below) installation of condensate pots and insulation.



Northern Natural uses bellows-type orifice meters for

Measuring wet high pressure gas

By CLYDE C. COPPER Northern Natural Gas Co., Omaha

FOR many years we measured sweet dry gas from the Hugoton fields of Kansas and Oklahoma and the Skellytown field in Texas. And, we measured sour but reasonably dry gas in the Otis (Kan.) and Permian basin of Texas and Oklahoma. Most of our meter freezing problems had been corrected by simply installing the meter near the wellhead. We measurement people at Northern Natural had grown quite smug about measurement difficulties.

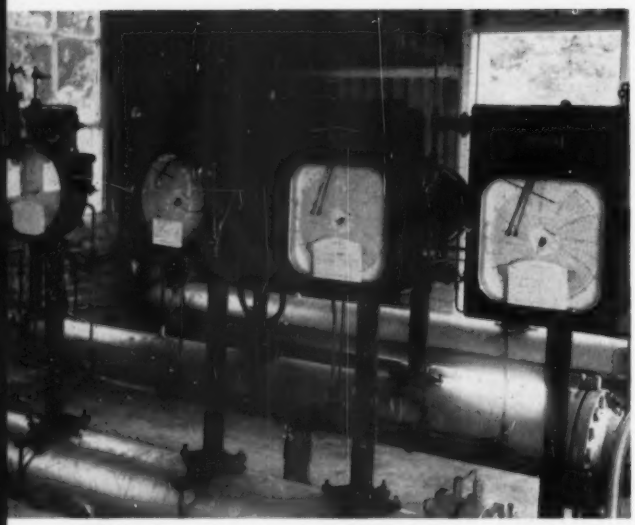
Upon entering the Anadarko basin of Hansford and Ochiltree counties, Texas for a new supply of gas, we were in for a thorough "shaking up." This high pressure wet gas caused freezing in the mercury pots of our conventional type orifice meters at a rate beyond reasonable maintenance.

In the interest of eliminating meter freezing, we launched the following campaign:

1. Requests were made with the well producers to maintain a higher temperature on their heaters. They were notified of malfunctioning separator equipment.
2. Condensate pots were installed on the meter manifold.
3. The ¼-in. meter run tap needle valves were replaced with ½-in. gate valves.*
4. The ⅜-in. diameter meter manifolding was increased to ½-in. diameter for about 20 in. above the condensate chambers.
5. Insulation was placed around meter run tap valves.
6. Meter manifold design was changed, all horizontal piping was eliminated and a continuous grade was maintained in the piping so that liquids must drain back into the meter tube.

It would be ludicrous for me to write that this program did not prevent some of our meters from freez-

* The ¼-in. needle valves have now been reintalled. The ½-in. gate valves could not be closed without a wrench when the seat contained ice.



Bellows-type orifice meters of four different manufacturers set in parallel at Northern's South Omaha town border station.

ing. While some freezing was eliminated, it did not stop nearly all of it. We still had problems.

Some time ago, we had freezing troubles on wellhead meters in our underground storage field near Redfield, Iowa. Our problems there were solved by the installation of bellows-type orifice meters. If they would eliminate meter freezing in the storage project, why not try them with our new trouble baby, the Hansford county, Texas field?

We now have about 125 dry-type meters in service in this wet gas field and while our freezing problems have not been eliminated, they have been greatly minimized.

Prior to the changeover, it was not uncommon to remove the top of a mercury chamber in a mercury-type meter, remove all ice, distillate and water, place the meter back in service and then experience a recurrence of freezing in the meter again on the same day.

It would now seem that we are ready for the question: Why do mercury-type orifice meters freeze when bellows-type orifice meters operating under identical conditions do not freeze, or the freezing problems are greatly reduced? The answer is principally this: Both the high and the low side mercury chambers on the mercury-type meter have the pressure connections on the top side. Any condensation or liquid entering the chamber through the meter manifold is entrapped and has no means of escape. All that is now required to create freezing conditions in the mercury chamber of the meter is for gas temperature to reach the critical dew point or for a drop in ambient temperature. Now, the bellows-type orifice meter has both the high and the low side connected to the pressure manifold on the bottom side of the meter. This permits any condensation and liquid which may enter the meter through meter piping to drain via the same route through which it entered.

Condensation of liquid in a mercury-type meter does not collect commensurately in the high and low pressure chambers. A differential error of several inches may result from unequal condensate in the mercury chambers, even without freezing conditions. The self-draining dry-type meter has eliminated possibility of errors from such conditions.

We have the utmost confidence in the accuracy of bellows-type orifice meters. Our tests to date reflect that they are just as accurate as mercury-type orifice meters. The diaphragms are quite sensitive and react more readily to changes in load conditions, pulsation, etc., than do mercury-type meters. It is therefore necessary in some cases to dampen bellows meters more than mercury meters.

An economic facet of bellows-type orifice meters is the elimination of costly mercury losses due to leakage or theft. Inventory of repair or replacement parts is only a fraction of that required for mercury-type meters. Also the use of mercuryless meters definitely ends the controversial question of "Monometer Factors."

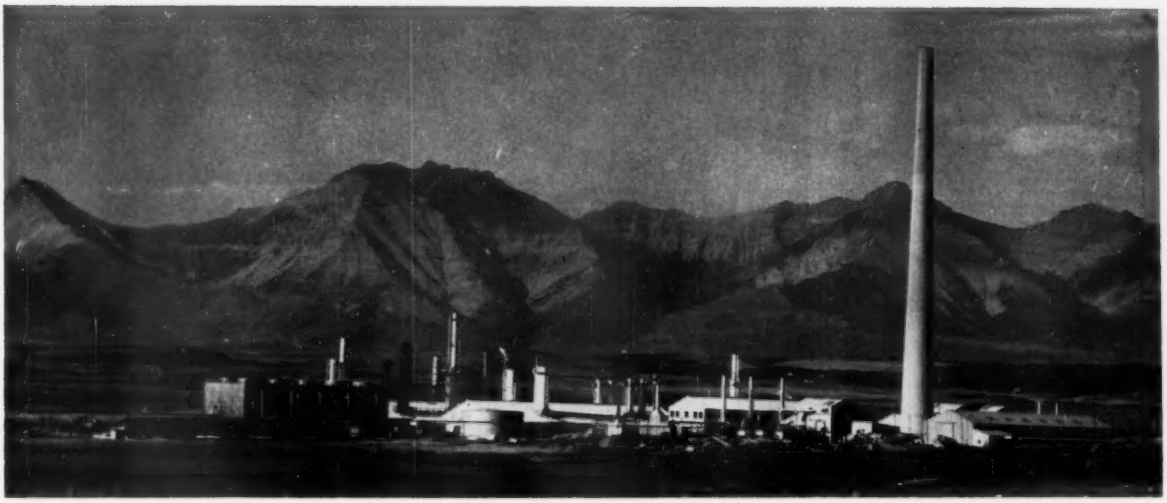
It is not necessary that a dry-type meter be level; therefore, the use of leveling saddles may be eliminated. Another advantage is the temperature compensator inside the diaphragm assembly in the high pressure chamber. It adjusts the total capacity of the two assemblies to the changing volumes of the liquid filling resulting from ambient temperature change. This minimizes differential zero shift to change in either static pressure or ambient temperature.

The range of dry-type meters may be changed from a 0-20-in. differential through several intermediate ranges to a maximum 0-300-in. differential by merely changing a spring inside the meter. Only a few minutes are required to make this change. To accomplish the same range changes in a mercury-type meter requires changing the mercury chamber for each required differential range. This is a time consuming and expensive operation; the meter naturally is out of service and measurement is unavailable during the changeover period.

From a negative viewpoint, we have found that more time and know-how is required to calibrate the dry-type meter. Shop training programs with instructions on maintenance and calibration of the dry-type meter have been in progress in our Spearman, Texas meter shop for some time.

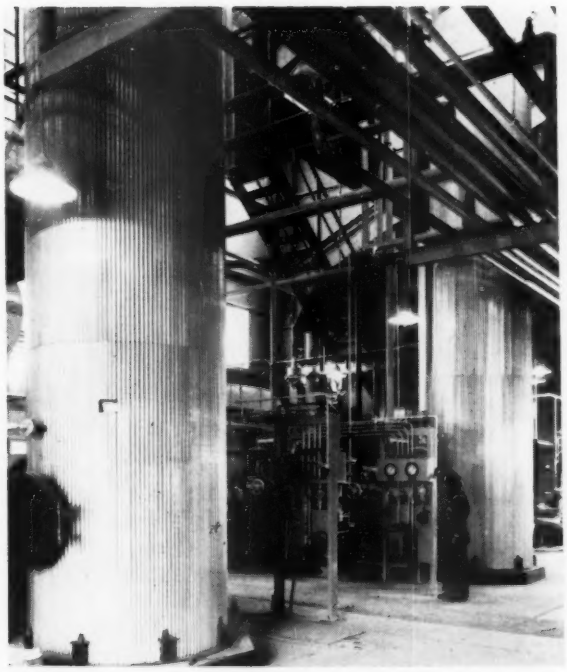
We have been using dry-type meters for only about a year. It would be conjecture on our part to flatly state that from now on our freezing problems will be practically eliminated as a result of changing from mercury-type to bellows-type orifice meters. Frankly, we do not expect to completely eliminate measurement freezing troubles in this wet gas, high pressure field. During the winter season when atmospheric temperatures in the Texas Panhandle are below 32 deg a great part of the time, measurement freezes will always be with us to some degree. Our efforts are in the vein of controlling and eliminating them wherever possible.

In the preparation of this brief article the omission of minute details, figures and graphs has been intentional. The paramount message that we desire to bring before the readers is the results of our experiment with dry-type orifice meters to eliminate poor measurement due to freezing and hydrate conditions. ■



Against a backdrop of the majestic Alberta Rockies, this $25 million gas processing and sulfur plant will be the largest single feed of natural gas to Trans-Canada Pipe Line's system. Incinerator stack at right is 350 ft high.

New gas processing plant boosts western Canada's economy



Hot gas from the reactor furnace passes through these large condensers to remove elemental sulfur in liquid state.

By GEORGE E. TOLES

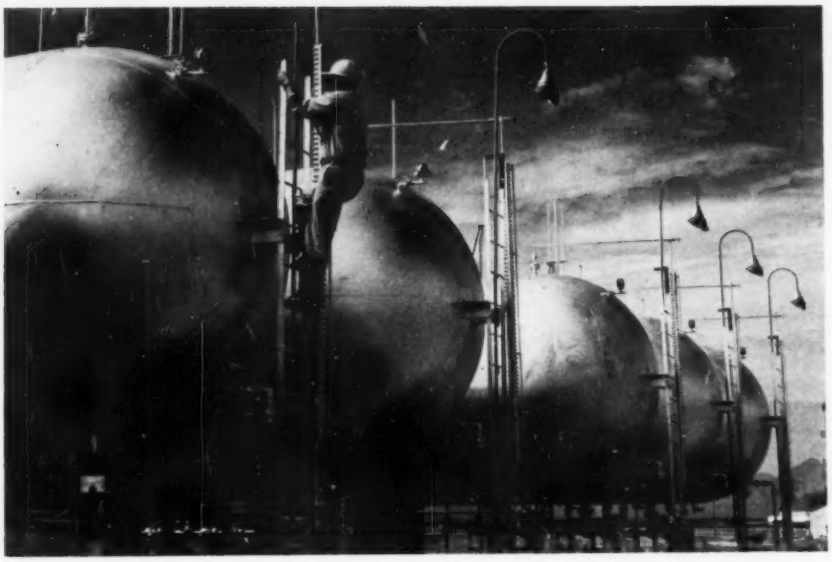
ON 150 acres of Alberta foothills stands one of western Canada's most important new industrial plants—British American Oil's Pincher Creek gas processing and sulfur plant.

It will process natural gas and is the most important single supplier of gas to the Trans-Canada Pipe Line. Also, there will be a range of products to help strengthen the economy of western Canada-propane, butane, distillate, and sulfur.

The plant was built in two stages. The Stage 1 plant, designed to recover only distillate and sulfur, returned the partially processed gas into storage reservoirs via gas injection wells, awaiting completion of the Trans-Canada line. The Stage 2 plant will extract the additional products of propane and butane and produce gas of pipeline quality.

The plant as presently constructed has 17 buildings. It has 10 large storage tanks—spherical and cylindrical—and two 20-car railway sidings.

Because its products have such a wide use in industry, it may well be that secondary industries will follow the completion of Stage 2 at Pincher Creek.



Regular pressure checks are made on these tanks used to store liquids such as butane, propane, and condensate extracted from natural gas.

The plant serves one of the largest gas fields in Canada. Pincher Creek is a sour gas field. This is true for about 50 per cent of proven gas reserves in western Canada.

Gas for the plant as produced from the wells contains free liquids. Wellhead separators operate at approximately 1200 psig. Vapor and liquid are delivered to the plant by separate lines, the gas at about 1000 psig and liquids at about 500 psig.

The gas goes to two inlet separators. Each has a capacity of 120 MMcfd. They remove hydrocarbon distillates and condensates. Gas then flows to four high pressure amine treating units where hydrogen sulfide and carbon dioxide are stripped by contact with a 20 per cent solution of aqueous monoethanolamine.

"Sweetened" gas is delivered to the main hydrocarbon absorber where propane and heaviers are absorbed in a stream of lean stripping oil. Residue gas from the absorber is scrubbed to remove traces of oil and then passed to a gas dehydration unit.

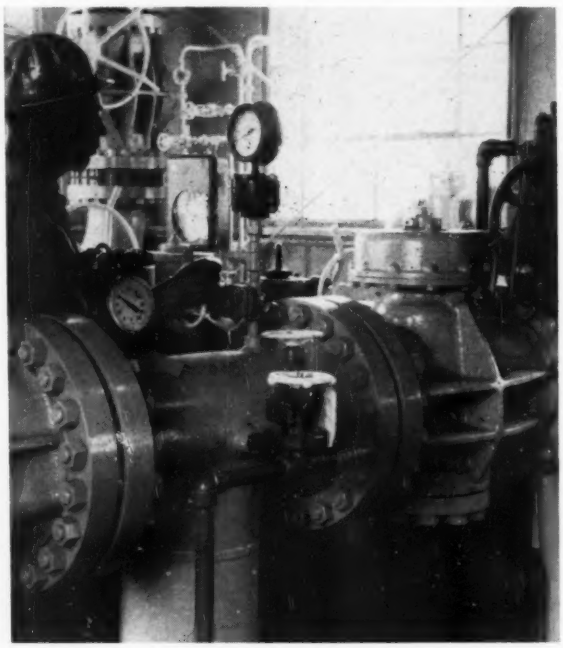
This unit has solid desiccant dehydration beds for removing moisture from the gas to a maximum of 4 lb per MMcf. There are two dehydration contactors; one can be regenerated while the other is in operation.

Dehydrated gas passes from the dryers through a check meter station and into the sales gas line through a pressure regulating station set at a maximum of 900 psig. At this point, there is provision for taking gas from the dryers to the suction of injection compressors. This is used when residue gas is to be reinjected into the field.

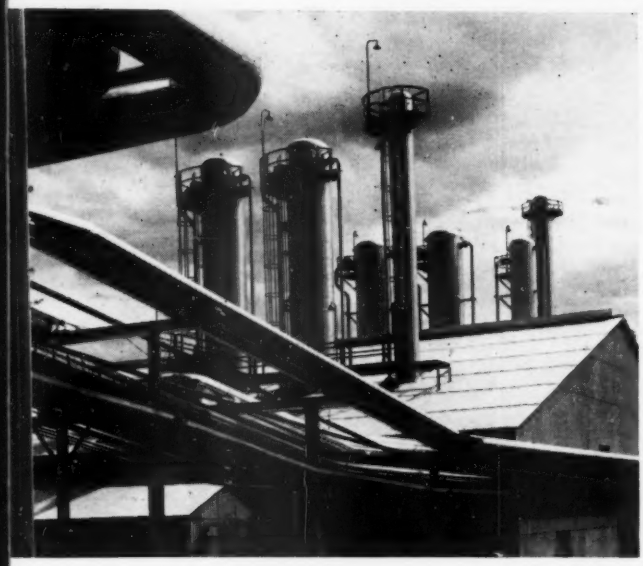
The liquid phase from the well, which reaches the plant through its own flow line, goes to a liquid separator, similar to the gas separators, and then to the condensate stabilization unit. Here butane gas and lighter hydrocarbons are removed as vapor by the application of heat from a fired reboiler. This leaves stabilized or debutanized hydrocarbon condensate. The stabilized condensate is cooled by passage through several heat exchangers and goes to storage.

Vapors flashed from the inlet liquid separator are delivered to the 500-psig vapor amine contactor. There, hydrogen sulfide and carbon dioxide are removed with aqueous monoethanolamine. Vapors from the condensate stabilization unit are similarly treated by contact with the same solution in a 125-psig vapor amine contactor. This removes acid gases.

Enriched amine from bottoms of the contactors is collected in a rich solution vent tank where hydrocarbon gases in solution are flashed off and delivered to the boiler fuel system. The amine solution is then



Workman checks gauges in one of 17 buildings at the new plant.



In the amine treater building at plant, hydrogen sulfide and carbon dioxide are removed from acid gas in an amine contactor and later stripped from solution in an amine regenerator.

heated in the main amine solution exchangers and flowed to the amine regenerator. There, hydrogen sulfide and carbon dioxide are stripped from the solution by heat supplied to the bottom of the regenerator from steam-heated reboilers.

Vapors from the top of the regenerators are cooled to condense steam and amine vapors. This produces a gaseous mixture of hydrogen sulfide and carbon dioxide for feedstock to the sulfur recovery plant. The regenerated amine solution is cooled in the main amine solution exchangers and pumped back to the contactors.

Treated gas from the 500 and 125 psig vapor contactors is absorbed by lean stripping oil in a reabsorber and a demethanizer, respectively, to remove propane and heavier components. Residue gas from these vessels goes to a glycol-type fuel gas dehydration unit. It is then used as fuel in plant and field facilities.

Absorption oil from the absorbers flows to the demethanizer. Most of the methane is removed by the use of heat. Oil is then pumped through a direct-fired heater to the main still. Propane, butane and natural gasoline fractions are stripped from the absorption oil with steam. Lean absorption oil is cooled and pumped back to the absorbers.

The lean oil still has some use. It provides a narrow boiling range, and high molecular weight lean oil to replace mechanical and vapor losses in the absorption system. It removes (as a bottom product) high boiling point components which might accumulate in the oil from inlet gas or elsewhere.

Feed used in the lean oil still is stabilized condensate and a slip-stream from main still bottoms.

The overhead product, with a boiling range of 450 to 550 deg F, is condensed and pumped to the main still as a side reflux. The bottom product of heavier hydrocarbons is pumped back into the stabilized condensate line to storage.

Raw overhead products from the main still contain mercaptans which are removed in the caustic treating unit. Raw product is contacted with a 10 per cent sodium hydroxide solution in the caustic contactor. Mercaptans are carried out with the caustic solution and flared, after being stripped from the caustic solution by steam in a caustic regenerator. The hydrocarbon product passes through a sand filter to remove entrained caustic and water, and then goes to the fractionation system.

The fractionation unit has a de-ethanizer, depropanizer, debutanizer, and other associated equipment. De-ethanizer feed is heated by exchange and steam preheater before entering the de-ethanizer, which removes essentially all ethane and some propane. Ethane and propane flow to a reabsorber as a vapor recycle stream.

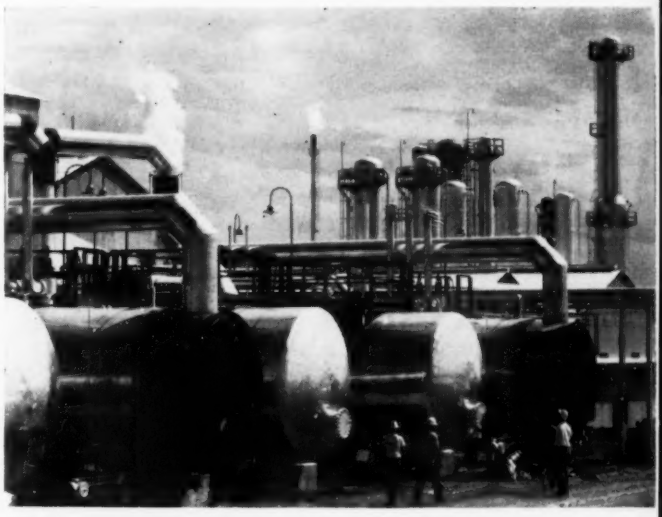
The de-ethanized bottom product is pressured to the deproponizer, where NGAA specification propane product is prepared as the overhead product, condensed and pumped to storage.

Depropanized bottoms are pressured to the debutanizer where a NGAA specification butane product is the overhead result. This also is condensed and pumped to storage.

The debutanizer bottom product is debutanized condensate which is blended with the stabilized condensate, cooled, and pumped to storage.

The sulfur recovery plant at Pincher Creek is three basically identical units, each capable of producing 235 long tons of sulfur a day. The process consists essentially of burning one-third of the hydrogen sulfide to make sulfur dioxide. The sulfur dioxide contacts the remaining volume of hydrogen sulfide in the presence of a catalyst. This forms elemental sulfur.

Acid gas from the amine regenerator is delivered



Workers are dwarfed by units which process natural gas for transmission, removing propane, butane, condensate and sulfur.

Efficient, semi-automatic design of the new plant is reflected by this central panel. Here, most of the plant's complex processes are controlled.

to the combustion chamber of the reaction furnace. It is burned with a controlled volume of air. Heat is removed by production of 175-psig steam. Some sulfur is condensed in the convection section of the reaction furnace. The gas is further cooled by passing it through the first sulfur condenser.

Heat is removed by generation of 60-psig steam, and more sulfur vapor is condensed. The gas is reheated by an auxiliary burner, passed through a catalytic converter (bauxite is the catalyst), and sent into the second sulfur condenser. More sulfur vapor is condensed. Heat is removed by generation of the 60-psig steam.

Gas is reheated by the second auxiliary burner and passed through a second catalytic converter to the third sulfur condenser. The gas stream is cooled by preheating the boiler feed water, and sulfur is condensed.

The gas stream then flows upward through a bed of Raschig rings in the coalescer. This removes any entrained sulfur mist. Exit gas from the coalescer is burned to sulfur dioxide and water before being dispersed to the atmosphere through the stack.

Liquid sulfur produced in the process is withdrawn from the various points as it is condensed. It is accumulated in the liquid sulfur tanks for discharge to storage.

Steam for the Pincher Creek plant is generated in three main boilers. Each has a capacity of 100,000 lb per hr at 300 psig, superheated to 500 deg F. In addition, steam is generated in the sulfur plant.

Electrical power is purchased There are power lines from two entirely separate sources, to reduce the risk of power failure.

An induced draft cooling tower provides circulating water for process cooling. Makeup water for plant operations comes from a small lake created by damming the Drywood River about a mile south of the plant.

The process portion of the plant is controlled, to a large extent, from a central control room. Storage facilities consist of two 750 long-ton liquid sulfur tanks, two 17,000-bbl condensate spheroid tanks, three 56,000-gal. propane tanks, and three 56,000-gal. butane tanks. In addition, a portion of the sulfur is solidified into large blocks for storage.

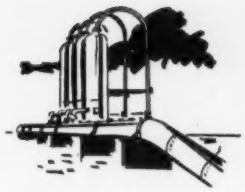
A 22-mile railroad spur provides rail service between the plant and the CPR station at Brocket, Alberta.

There are also extensive safety controls. Numerous alarms indicate malfunctioning of equipment. The plant may be completely shut down in the event of an emergency by an automatic system actuated from any one of several strategically located control points.

Fire fighting equipment, employing an adequate water system, has been installed. It is pressured at all times.

Special consideration was given to air and surface pollution during design and installation of facilities. Residual sulfur gases from the sulfur plant are burned to sulfur dioxide and discharge to the air through a 350-ft stack. Other waste gases are flared through a 200-ft stack with a continuously burning pilot light to convert any hydrogen sulfide to sulfur dioxide.

All liquid drips and drains in the plant are piped to the appropriate classifying system. Spent amine and other chemicals are drained to a special pit to prevent their escape from the plant. ■



ECONOMICS

in pipeline engineering

By FRANK V. WHITNEY • El Paso (Texas) Natural Gas Co.

THE question uppermost in minds of business people, when considering investment of capital, is "Will it pay?" By "Will it pay," is meant will the company recover its investment in a reasonable time. Recovery of an investment is made by producing a product or furnishing a service which can be sold at a price which will supply an income to the company sufficient to offset operating expenses, taxes, financing charges, as well as yield a profit. The problem of price determination in marketing and selling is a field in itself. It will not be dealt with here.

Price determination here will be on the basis of a cost of production or cost of service, as it is usually refered to in controlled industries. This cost of service may be used to determine: (1) which of several ways of performing the service is the most economical, and (2) which of the ways will enable the company to most advantageously recover its investment.

The purpose of this article is to review items to be considered by engineers in connection with preparing a cost of service study applicable to pipeline engineering, and the application of this information.

In preparing an economic study, an estimate of the cost of equipment and material installed is the first information determined. This cost not only includes equipment, material, and labor of installation as direct costs, but other costs, some of which have been developed as a percentage of the direct costs. These items are other field costs, contractor's fees, overhead and contingency. The other field costs include indirect field costs such as those listed in *Fig. 1.*

The contractor's fee is paid for the performance and direction of work. It will vary considerably due primarily to the nature of the work performed. It will include profit. And it could include engineering design, drafting, field superintendence, and other miscellaneous field expenses.

The general overhead costs are incurred by the company during construction of a project. This includes that portion of the company's home office expenses dedicated to construction work. A representative list of these items is shown in *Fig. 2.*

There is also a contingency provision which generally is taken at 5 per cent. However, it can vary depending upon the length of time required for completion of the project. A higher contingency is provided for projects which are foreign to a company's usual activities. In other words, if the company were venturing into a field in which it lacked background experience, the contingency should be raised to provide for unforeseen expenses. Generally speaking, howver, the contingency provides a pad in the estimate which will be used primarily for increased material and labor prices which occur during construction.

El Paso uses three different types of capital cost estimates.

The Class A, "initial estimate" is in the category of the "horseback type." It is prepared with a minimum of design information on facilities. The cost of these facilities is determined from estimating curves, similar to *Fig. 3,* which shows the cost of complete compressor stations, including off-site facilities. This curve has been prepared from past experience and is representative of 1956 costs. A cost index is needed to bring this information up to date. There are several of these indices available. However, we make use

FIG. 1. OTHER FIELD COSTS

A. *Items Included in 'Other Field Cost' Provision*

1. Camp & commissary
2. Construction superintendence
3. Field engineering & inspection
4. Field office expense
   a. Communications
   b. Medical
   c. Office & clerical
   d. Warehouse
5. Other general costs
   a. Indirect labor
   b. Small Tools
   c. Scrap
   d. General clean-up
   e. Painting equipment
   f. Preliminary operations & tests
6. Temporary structures & facilities
7. Allocated general field office
8. Right of way dept. expense
9. Undistributed material
10. Payroll insurance
11. Payroll taxes

B. *Other Field Cost as % of Direct Cost*

1. Pipelines	3%
2. Gathering systems	8%
3. Compressor stations	5%
4. Treating & dehydration plants	3%
5. Gasoline plants	4%
6. General structures & communications	6%
7. Meter stations	2%
8. River crossings	1%
9. Leaseholds & gas wells	4%
Average	4%

of the Nelson Refinery Construction Index, where applicable.

The Class B, "preliminary estimate," is prepared when additional design information is available. In this type of estimate, the major equipment included therein is investigated and an estimate prepared. For instance, the size of the compressor units and the auxiliary power plant installation are determined, as well as housing for plant personnel. The major components for these estimates are derived from curves, installation factor method, or tabular information as experienced by El Paso.

The Class C, "final estimate" is, of course, the detailed bill of material estimate which is prepared after all design questions have been settled and actual quotations received for the equipment. It requires a considerable length of time. Each bill of material is priced and installation labor is determined by man-hour estimates or the factor method. This type of estimate requires an on-the-spot survey of the conditions at the plant sites, which would include investigation for excavation, grading, soil conditions as affecting foundations, and other factors.

Whenever a company is considering an expenditure of capital, initial stages of the study should probably be conducted by use of the Class A estimate. During these initial stages, the several possible ways of accomplishing the task are determined. Those which appear to be economical are studied further. As the design is more closely defined with resulting improvement in facility information, the accuracy of the estimate will be improved by use of the Class B or Class C estimate. Logic should be applied in determining those factors which appreciably influence the cost of the job and concentration of effort applied to them. Construction and operating experiences are invaluable in determining the important factors in a study.

• Annual Expenses

The annual expenses are the items which are used to make up the cost of service. These are, essentially, the costs of owning and operating the equipment which has been installed.

These expenses are divided into two categories. The first are those which represent operating and maintenance labor with their accompanying supplies and expenses, raw materials such as gas, which would be used for fuel, as well as purchased power or water. There would also be the administrative and general expenses incurred in the home office.

The second category of annual expenses are those "fixed expenses" which can be related by percentage to capital expenditure. These expenses would include depreciation, interest, taxes, return on investment, and Federal Income Tax on the return.

• Operation and Maintenance

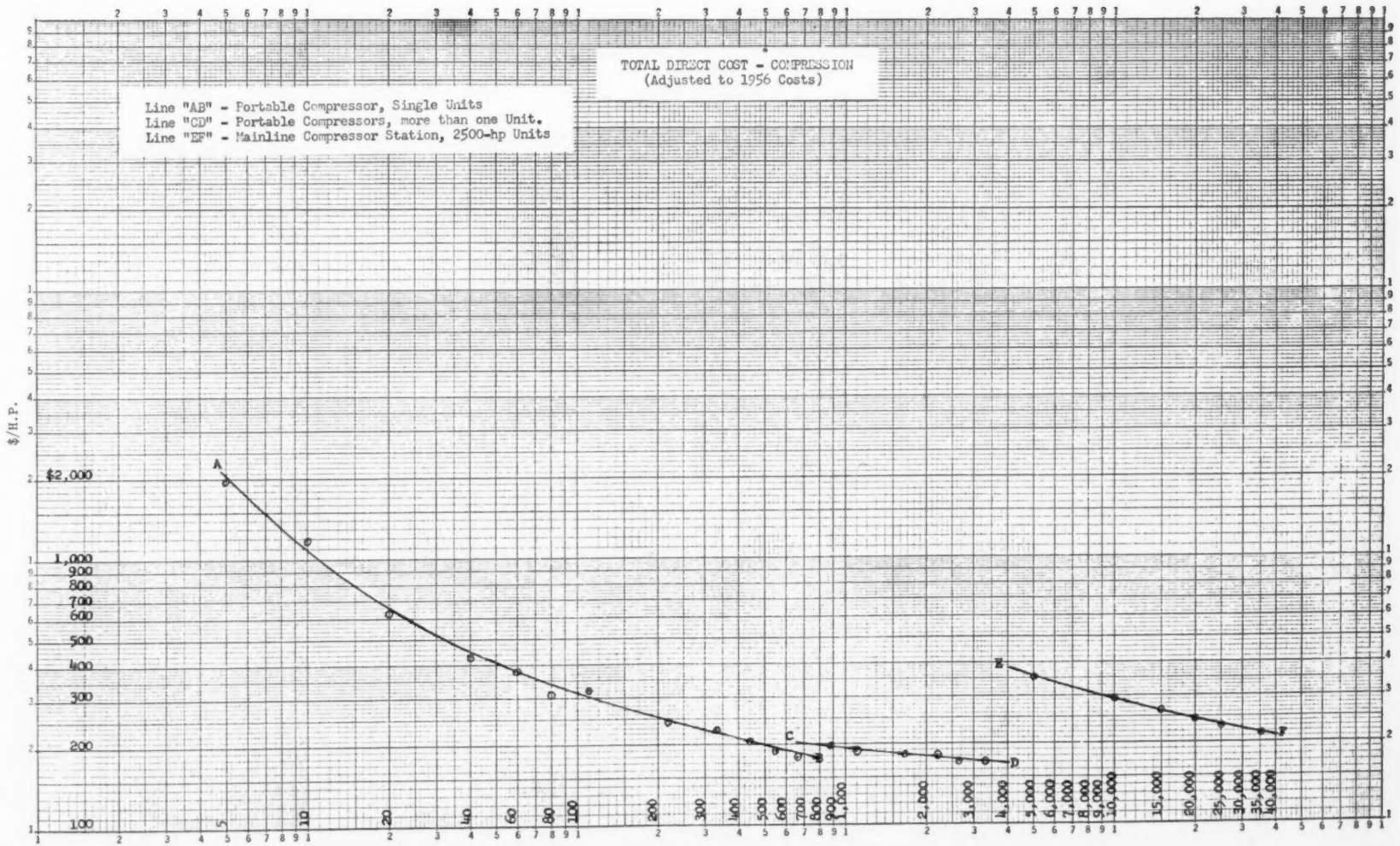
In preparing an economic study, the planned facilities will require operation and care. The items which make up this expense should be determined and proper allowance made for them. Manning should be set in the form of either added men required or a proportionate share of the existing manning which is dedicated to new plant. Dependability of equipment being installed should be decided and proper allowances made for expected maintenance. The expected cost of any raw materials for the facilities to function should be determined such as fuel, water, and power.

Unit costs for the operation and maintenance expenses can be derived from past experience. These unit costs can be expressed in terms of unit of production of the final product to cover the over-all operation and maintenance expense of particular types of plants. They can also be developed for individual components of expenses such as power—hp or kilowatt—steam, water, etc.

FIG. 2. BREAKDOWN OF GENERAL OVERHEAD COSTS

DESCRIPTION	*AS PERCENTAGE OF DIRECT COST*
Engineering	1.35%
Inspection	0.15%
Legal services	0.02%
Auditing services & expenses	0.10%
Preliminary survey & investigation	0.04%
Executive department	0.01%
Insurance & taxes	0.03%
General const. accounting department	0.35%
Purchasing & traffic department	0.10%
Interest during construction	2.85%
TOTAL	5.00%

Figure 3

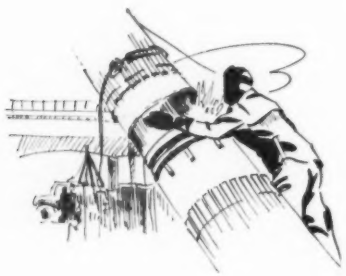


Engr. Eco. (RMH)

FIGURE 3.

One of the most important features that cannot be stressed too highly is that complete knowledge is obtained about the items included in any dollars which are provided in the study. It would be false to accept and use any unit costs without first completely investigating what the costs represent. Everyone has a reasonable idea of what is included in the unit costs for controlled industry governed by the uniform system of accounts. This, generally speaking, is true. However, different practices within firms regarding scheduled maintenance, manning needs as dictated within states, policies with regard to oil changing in engines (which could be either the operator's judgment or after a fixed number of hours of operation) can vary the costs.

I cannot help but be reminded of a situation several years ago where I was present during a technical group meeting. The speaker had indicated X number of dollars per hp for operation and maintenance. One of the listeners sitting behind me grumbled under his breath, "I can beat that all hollow." I would be perfectly willing to bet that the listener and the speaker, after they had reviewed the background and compared what was included in the unit costs, would have found that they were on similar ground and any differences between the unit costs, which each of them had in mind, could be laid to company policy or regulation rather than the fact that one man can operate cheaper than another.



Essentially, with very few exceptions, if duplicate equipment were placed in two different plants, they would perform and cost about the same to run and maintain. It should be understood, of course, that we are excluding any location peculiarities of the equipment as affected by weather and adverse conditions such as are sometimes present in chemical plants.

Again, may I emphasize, "know what is behind and what makes up each of the dollar signs with which you are working."

• General and Administrative Expenses

There is enumerated in *Fig. 4* a representative list of general and administrative expenses. Incorporation of this expense is required in the study. It can be done by expressing G & A as a percentage of the operation and maintenance. This percentage is developed by the following relation:

% General & administrative =

FIG. 4. GENERAL AND ADMINISTRATIVE EXPENSES

Salaries of general officers and executives
General office salaries
Expenses of general officers
Expenses of general office employees
General office supplies and expenses
Special services
Special legal services
Regulatory commission expenses
Insurance premiums
Injuries and damages
Employees welfare
Pensions
Miscellaneous general expenses
  Fees of trustees, registrar, transfer agent, stockholder's expenses
  Association dues and memberships
  Sundry
Maintenance of general structures and improvements
Maintenance of general office equipment supplies and expenses
Rents

$$\frac{\text{Total company general \& administrative expense}}{\text{Total company operation \& maintenance expense}}$$

Multiplication of the study operation and maintenance by this percent so obtained will provide allowance for this expense.

The important feature is to maintain consistency in the items contained in the operation and maintenance expenses. In other words, the percentage developed should be applied to the operation and maintenance expenses contained in the study which are consistent with those used in determining the total operation and maintenance of the company.

• Fixed Expense

Each of these items can be expressed as a percentage of the capital investment. This percentage will provide the annual expense for each of the fixed expenses of sufficient accuracy for study work.

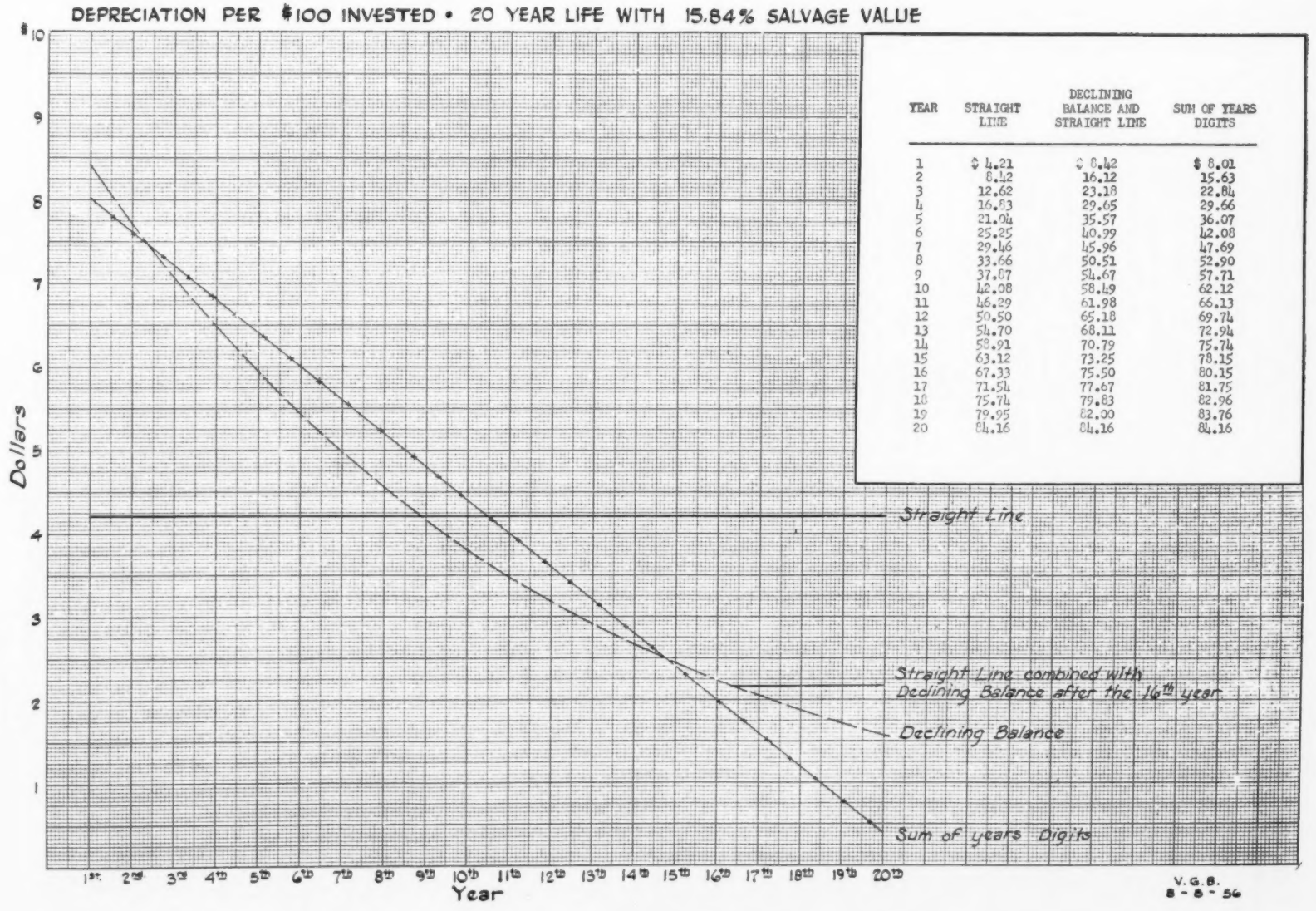
The percentages of the capitalization can be expressed as those which would occur as an average for any period over the life of the project. By developing these percentages, we have found a considerable time-saving element in making annual cost studies for various projects. You can readily recognize the laborious task of finding the year-by-year fixed expenses.

• Depreciation

Many definitions and terms are used to describe depreciation. And, there are several different applications of this annual expense.

As used by El Paso, depreciation is the process of charging expense and crediting reserve for depreciation with an amount of money which, gathered over a period of years, is equal to the initial cost of the facility, less salvage value. Deciding on how long reserve for depreciation is to be accumulated has been governed by the factors of gas supply and physical life of the facilities which are installed.

The effect that gas supply life has on depreciation is appreciable. This same thought could be applied to other industries. When a company spends capital


DEPRECIATION PER $100 INVESTED • 20 YEAR LIFE WITH 15.84% SALVAGE VALUE
Dollars
Year
Straight Line
Straight Line combined with Declining Balance after the 16th year
Declining Balance
Sum of years Digits
V.G.B. 8-8-56

YEAR	STRAIGHT LINE	DECLINING BALANCE AND STRAIGHT LINE	SUM OF YEARS DIGITS
1	$ 4.21	$ 8.42	$ 8.01
2	8.42	16.12	15.63
3	12.62	23.18	22.84
4	16.83	29.65	29.66
5	21.04	35.57	36.07
6	25.25	40.99	42.08
7	29.46	45.96	47.69
8	33.66	50.51	52.90
9	37.87	54.67	57.71
10	42.08	58.49	62.12
11	46.29	61.98	66.13
12	50.50	65.18	69.74
13	54.70	68.11	72.94
14	58.91	70.79	75.74
15	63.12	73.25	78.15
16	67.33	75.50	80.15
17	71.54	77.67	81.75
18	75.74	79.83	82.96
19	79.95	82.00	83.76
20	84.16	84.16	84.16

FIGURE 5.

FIG. 6. COMPUTATION OF FIXED CHARGES FOR ECONOMIC STUDIES

INTEREST

15-Year Amortizable Debt and a ¾-¼ Long Term Debt-Equity Ratio.

A. *At End of:*	*B. Interest-Bearing Principal Remaining*	*C. Ave. Annual Interest-Bearing Principal*
½ Year	75.000	
1 Year	75.000	75.0000
1½ Years	75.000	
2 Years	72.321	73.6605
2½ Years	69.642	
3 Years	66.963	68.3025
3½ Years	64.284	
4 Years	61.605	62.9445
4½ Years	58.926	
5 Years	56.247	57.5865
5½ Years	53.568	
6 Years	50.889	52.2285
6½ Years	48.210	
7 Years	45.531	46.8705
7½ Years	42.852	
8 Years	40.173	41.5125
8½ Years	37.494	
9 Years	34.815	36.1545
9½ Years	32.136	
10 Years	29.457	30.7965
10½ Years	26.778	
11 Years	24.099	25.4385
11½ Years	21.420	
12 Years	18.741	20.0805
12½ Years	16.062	
13 Years	13.383	14.7225
13½ Years	10.704	
14 Years	8.025	9.3645
14½ Years	5.346	
15 Years	2.667	4.0065

Above based on 28 payments beginning 18 months after issuance, the first 27 equal payments of 2.679 and the 28th of 2.667.

Note: 1. To get interest for any given year, multiply the proper Ave. Annual Interest Bearing Principal from Column C by Annual Interest Rate (as decimal).

2. To express interest as per cent of C. I. use Note 1 percentage as decimal.

funds, it is done with one of the basic elements of business risk incorporated in the decision before proceeding with the project. The consideration: "Will the raw materials needed for the facilities be available for a long enough period of time so that the cost of producing the product will not be distorted by a high annual depreciation cost?"

As far as the physical life of the plant is concerned, it is expected that depreciation reserves would amass enough money so the initial plant could be replaced when it wore out so that the service could be maintained.

There are, of course, other items which enter into finding the depreciation rate. Technological improvements which out-date equipment must be considered.

One of the most common depreciation schedules is based on the straight line method. This method provides a fixed amount each year and is determined by:

$$\text{Depreciation/Year as \% of Capital Investment} = \frac{100\% - \text{Salvage Value as \%}}{\text{Depreciation Life in Years}}$$

There are other methods of depreciation such as the declining balance and sum of the digits. These are used to provide high depreciation rates in the early years for rapid recovery of the capital investment. *Fig. 5* is a comparison of four methods of depreciation. Note that the total accumulated depreciation reserve is the same for each method. Therefore, the choice of methods is immaterial when considering the average over the life of the project.

• Interest

The item of interest, as annual expense, is that charge for funds which are borrowed in order to finance a capital expenditure. If there are no borrowed funds involved for the project, there may be no interest charges. However, the non-borrowed funds used for the project could be invested instead of being used for the project. In this event, it may be advisable to charge interest to the study due to the use of these funds rather than investment of them.

The computation of the annual interest expense depends upon the following factors: the term of the loan, the manner of repayment, interest rate, and debt-equity ratio.

The term of the loan, of course, is the number of years over which repayment of the loan is to be made.

The manner of repayment is the number of payments which are to be made, generally semi-annually.

The debt-equity ratio is the ratio of the borrowed money (debt) to the amount provided from other company sources (equity).

FIG. 7. EXAMPLE OF COST OF SERVICE STUDY

A. Capital investment (CI)

Equipment installed		$	
Other field cost		$	
Contractors fee		$	
Total direct costs		$	
Overhead 5%		$	
Contingency 5%		$	
Total capital investment		$	

B. Annual expenses

Operation & maintenance			
Manning.....$/Year/Man		$	/Yr.
Fuel.....¢/Mcf		$	/Yr.
Power .....¢/KWH		$	/Yr.
Water .....¢/M Gal.		$	/Yr.
Maintenance.....% of CI		$	/Yr.
Misc. & other costs		$	/Yr.
General & adm. .....% of O & M		$	/Yr.
Fixed expenses			
Depreciation	%		
Interest	%		
Taxes	%		
Return	%		
Federal taxes	%		
Total	% of CI	$	/Yr.
Total annual expenses		$	/Yr.

C. Cost of service

$$\text{Cost of service/unit} = \frac{\text{Total Annual Expenses}}{\text{Total Units Handled Annually}}$$

Form 7-169R (8-58)

EL PASO NATURAL GAS COMPANY

ENGINEERING ECONOMICS DIVISION

PROJECT ANALYSIS

Sheet No. _____

Date _____

By _____

PROJECT

_____ M²CFD

CASE _____

FLOW SHEET _____

ESTIMATED COST OF REQUIRED FACILITIES	QUANTITY	UNIT COST	TOTAL COST
PIPELINES			
	mi.	$ /mi.	$
	mi.	/mi.	
	mi.	/mi.	
	mi.	/mi.	
	mi.	/mi.	
Total Direct Cost Pipelines			$
RIVER CROSSINGS			$
COMPRESSION			
	H.P.	$ /H.P.	$
	H.P.	/H.P.	
	H.P.	/H.P.	
	H.P.	/H.P.	
	H.P.	/H.P.	
	H.P.	/H.P.	
	H.P.	/H.P.	
	H.P.	/H.P.	
	H.P.	/H.P.	
Total Direct Cost - Compression			$
COMMUNICATIONS			$
METER STATIONS			$
GENERAL STRUCTURES & EQUIPMENT			$
Total Direct Cost			$
Plus: General Overhead @ 5%			$
Contingency @ 5%			$
TOTAL COST			$
		USE	$

ESTIMATED COST OF SERVICE @ % LOAD FACTOR & 6¼% RETURN

		QUANTITY	UNIT COST	FIRST YEAR	FIVE YEAR AVERAGE
Transmission Line Expenses, Operating & Maintenance		mi.	$ /mi.	$	$
Compressor Station Expenses, Operating & Maintenance	- Reciprocating	H.P.	/H.P.		
	- Electric	H.P.	/H.P.		
Compressor Station Expenses, Fuel		MCF	¢/MCF		
Purchased Power		H.P.	/H.P.		
Adm. & General and Division Office Expenses					
Fixed Charges to Include: Depreciation, Taxes	First Year-		%		
Interest and Return on Investment	5 Yr. Avg.-		%		
TOTAL - EXCLUSIVE OF COST OF GAS				$	$
COST PER MCF (*MCF/YR.)*				¢	¢

FIGURE 8.

Fig. 6 is an interest chart of the type which can be developed for any term of loan, manner of repayment, and debt-equity ratio. This chart may then be used for any desired interest rate.

The key to the preparation of *Fig. 6* is Column B and is the division of the 75 per cent into the number of payments to be made. Note that a slight adjustment is required for the 28th payment.

• Taxes Other Than Federal Income Tax

There should be included in the annual expenses an item for taxes other than Federal income tax. These would include those ad valorem taxes levied by the state, county, and school districts, etc., within which the facilities are installed. They could also include payroll taxes, franchise taxes, and sundry taxes. Generally speaking, 1 to 1.5 per cent of the capital investment will cover these items adequately.

Exact lists of evaluation and tax rates for various types of installations can be obtained from the company tax personnel. However, for study purposes, this is a relatively small item and can usually be handled for the above indicated percentage.

• Return on Investment

Return on investment is involved with the profit that a controlled industry may make. In the case of transmission of natural gas, the FPC is the government agency that exercises control, and therefore, regulates the rate of return and resultant profit. The return on investment may not be all profit. If funds are borrowed, the interest thereon is paid out of the return on investment. To illustrate, assuming a 6½ per cent rate of return, profit is determined by multiplying 6½ per cent by the average annual investment, i.e.,

(capital investment—salvage value) x 50 per cent

which gives total return on investment. By subtracting interest from the total return on investment the allowed profit to the company is determined. This may be expressed as a percent of capital investment by substituting 100 per cent in place of the capital investment and using salvage value as a percentage. This profit is the residue available to the company after payment of Federal income tax, and represents 48 per cent of the sum of profit plus Federal income tax when income tax is 52 per cent.

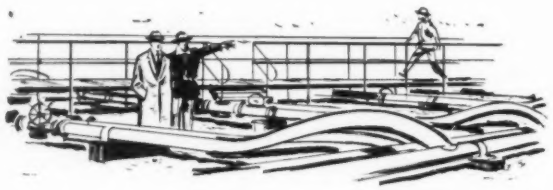
In non-controlled industries, the procedure could be essentially the same. The only difference would be that these companies can set the profit for study purposes as a percentage which will enable them to compete in the competitive markets.

• Federal Income Tax

For corporations with net income in excess of $25,000, Federal income tax is 52 per cent of total profit. Since, by preceding definition, return represents 48 per cent profit, the calculation for Federal income tax is $52 \div 48 = 1.0833$. This factor times the return (exclusive of interest) will result in a Federal income tax to be included in the cost of service. This may be expressed as a percent of capital investment by multiplying the return as a percentage of capital investment by 1.0833.

• Conclusion

The foregoing has been outlined so as to provide a basis for preparing a cost of service study. The actual format which may be used to present the study takes on numerous forms. *Figs. 7 and 8* are outlines which may be used for the preparation of the cost of service; *Fig. 7* for plant type studies and *Fig. 8* for pipeline studies.



Once the cost of service has been determined, this information can be used to compare methods of performing the service to determine which method is the most economical.

In controlled industries, the method of recovery of investment is outlined and time tables have been set with regard to its recovery. In other types of industries, the cost of service may be compared with the expected selling price of the service. If the selling price is higher than the cost of service, additional income will be available to the company to recover the investment in a shorter period of time. Each company will determine for itself what is an acceptable recovery of the investment. In so doing, the company will incorporate, based on its experience, the business risk factors which dictate the accepted recovery time. ■

The author wishes to acknowledge the able assistance of R. B. Herr, G. B. Heflin, C. E. McIntyre, and Virgil Cowart in the preparation of this paper, as well as the ideas and data contained therein.

This article is adapted from a talk presented at the PCGA Transmission Conference held in Palm Springs, Calif., April 29-30.

Welding crew applies finishing touches to prefabricated bypass piping.

Michigan Wisconsin crewmen inspect hot-tap machine prior to its use.

Tapping machine is lowered onto full-opening tapping valve, previously installed on the split-tee.

OPERATION STOPPLE

MICHIGAN WISCONSIN PIPE LINE CO. is expected by its utility customers to provide their natural gas needs on an uninterrupted basis. Fully recognizing this obligation, the company makes effort to do just that.

On a recent pipeline construction job, rather than shut down the pipeline leading into Green Bay, Wis., during the time required to install a prefabricated mainline valve assembly, stopples were installed. The use of stopples, together with a temporary hook-up of 6-in. diameter bypass piping between the stopples, made it possible to continue a flow of gas to Green Bay. The stopple designed and manufactured by T. D. Williamson Inc., Tulsa, was used.

Stopples were used on the Green Bay line when a 128-ft section of it was taken out of service. Within this area, a 15-ft length of the original pipeline was removed and replaced with a new prefabricated section containing an 8-in. plug valve flanked up stream and downstream by 4-in. blow-off plug valves.

Split-tees were first welded on opposite ends of the pipeline section to be isolated. Then, preparing one setting at a time, crew members mounted a hot tap valve (a full-opening gate valve) on the upright flange of the tee. The tapping machine was bolted in place on this flange. And, with the valve open, a workman rotated the lower-in crank to extend the boring bar until the pilot drill touched the pipe.

Willing hands carefully guide tapping machine into position on full-opening sandwich-type valve.

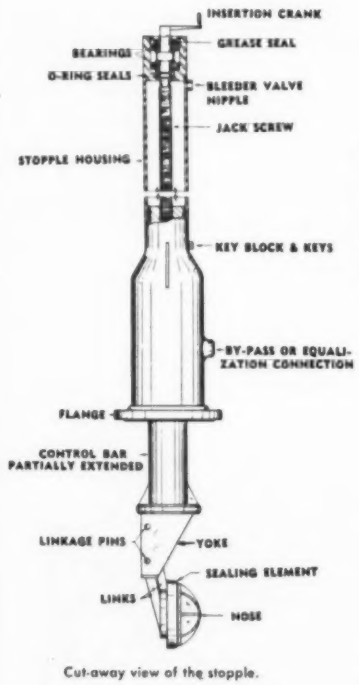
All other operations cease while operation of the tapping machine is checked.

Tapping machine is powered by compressed air fed through hose at right. Marking on measuring rod is check to determine depth of cut made by cutter.

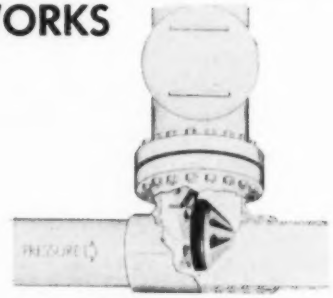
After hot tap is completed, crewmen prepare tapping machine for removal from the valve. In foreground, crewman removes blind flange from Green Bay lateral blow-off valve.

When the hot-tape cut through pipe line is completed, machine is removed from tapping valve. Note steel coupon cut from pipe on the pilot drill.

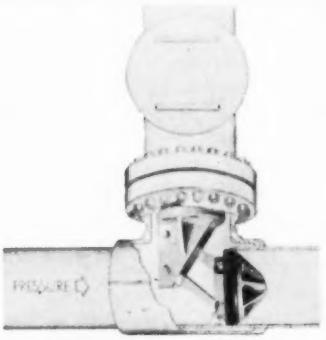
HOW STOPPLE WORKS



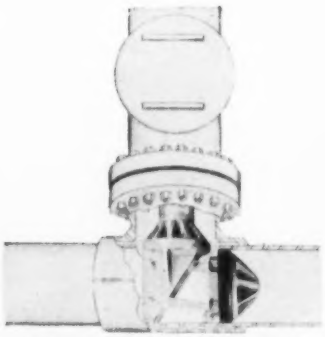
Cut-away view of the stopple.



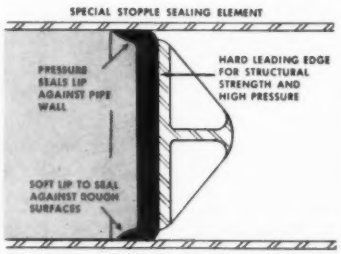
Stopple sealing element is lowered through the tapping valve and opening previously cut in the pipe.



As stopple sealing element contacts bottom of pipe, hinged nose section moves downstream from tapped opening.



When stopple yoke comes to rest on lower inside wall of pipe, sealing element automatically has positioned itself to completely stop gas flow through the pipe.


SPECIAL STOPPLE SEALING ELEMENT
PRESSURE SEALS LIP AGAINST PIPE WALL
HARD LEADING EDGE FOR STRUCTURAL STRENGTH AND HIGH PRESSURE
SOFT LIP TO SEAL AGAINST ROUGH SURFACES

Detail sketch of stopple nose and sealing element.

Stopple machine is mounted on full opening valve directly over hole in pipeline drilled by tapping machine.

Crewmen hook up swaged end fitting of 6-in. diameter bypass piping to the stopple.

The tapping machine was then ready to cut through the upper wall of the pipe. At this point, the men used compressed air power to drive the boring bar and cutter in making the pipe cut. In making a hot tap for a stopple job on the Green Bay lateral, a 7 15/16-in. opening was cut in the 8⅛-in. ID pipe. Once the cutter on the end of the boring bar had cut through the wall thickness of the pipe, the tap was completed. The coupon was retained on the pilot drill by spring-tension steel balls and was withdrawn as the boring bar and cutter were retracted. The valve was then closed and the tapping machine removed.

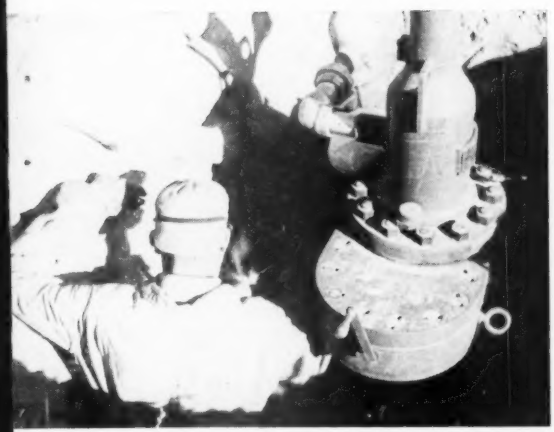
The next step was to mount the stopple machine on the closed valve. Then prefabricated bypass piping was connected between the stopples through which gas was routed around the work area. The by pass line was purged and the valves on which the stopples were mounted were opened. Workmen hand-rotated the insertion crank on top of the stopple, which lowered the sealing element through the opening cut in the pipeline. The element ultimately plugged the mainline, forcing the gas to flow through the temporary bypass piping.

The isolated section of line between the two stopple installations was blown down and 15 ft of it was removed and the prefabricated plug valve assembly was installed in its place.

Once the new valve assembly was tied in, it was purged of air and pressurized. The stopple sealing elements were retracted, restoring the flow of gas through the altered section of the Green Bay lateral.

At this point in the operation, the tapping valves on which the stopples were mounted were closed. The stopples and by pass piping were removed, and the tapping machine was reinstalled on the tapping valve to perform a final-stage operation.

OPERATION STOPPLE . . . Con't.



Note in foreground manual hand crank used for opening and closing the full opening valve. Stopple and bypass piping installation is complete and ready for service.

Completed stopple and bypass piping installation at south end of 128-ft section to be isolated.

Sealing element of stopple is lowered into the Green Bay lateral by manually rotating insertion crank.

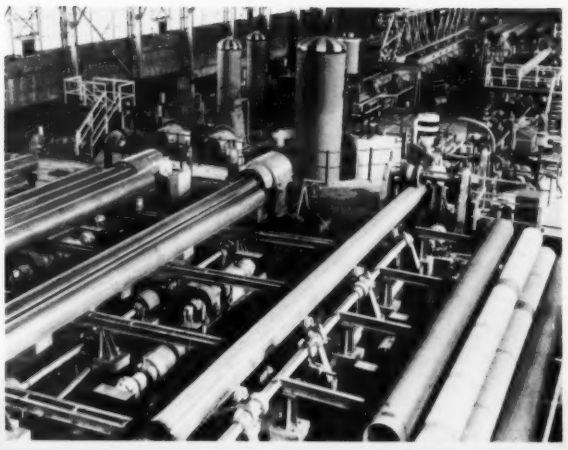
There's no better pipe than

More and more pipe buyers are simplifying and speeding up line jobs by specifying Youngstown Electric Weld. It possesses excellent line up characteristics, welds easily and its long lengths save time and trouble. For more information about Youngstown Electric Weld Line Pipe contact our sales and service offices throughout the oil and gas-producing country.

The Youngstown Sheet and Tube Company,
Youngstown 1, Ohio.

Youngstown in any line!

All Youngstown Electric Weld Line Pipe, 12¾" and larger, is full-length hydrostatically expanded to more uniform roundness. In this operation, internal water pressure forces the pipe out against the solid walls of a mantle. This increases its strength and enlarges the diameter . . . both of which make line up and welding a far easier job in the field. Final proof tests such as these are reasons why there's no better pipe than Youngstown on any line!



QUALITY YOUNGSTOWN SERVICE

Youngstown

ELECTRIC WELD LINE PIPE

After bleeding gas from the isolated section of pipeline through an open plug valve, 17-ft section is cut out.

Diagonal cut on one end made it easy to remove pipe section to be replaced.

Crewman measures alignment of new valve installation as it was lowered into position in the ditch.

OPERATION STOPPLE—Continued

Pipeliners steady overlapping end of existing pipeline as welder makes circumferential cut for the butt joint.

Attached to the end of the boring bar, and lowered through the valve assembly into proper alignment in the Lock-O-Ring flange on the split tee was a specially designed Lock-O-Ring steel plug. This plug has a precision cut groove in its side walls, used for locking it into the Lock-O-Ring valve flange. A steel ring segment is inserted into this groove from the Lock-O-Ring flange when the two are brought into proper alignment. The steel plug is also fitted with a neoprene O-ring around its circumference, which provides a tight seal against the inner wall of the valve flange. After the plug was thus locked in place, the boring bar of the tapping machine was retracted. Following this, the tapping machine and the tapping valve were removed from the valve setting.

Pipeliners then installed a blind flange seal over the Lock-O-Ring flange on the tee.

The job was completed as the crewmen doped and wrapped all the bare piping at underground level and backfilled the ditch.

Stopples have been used for similar jobs recently on the Allegan and Grand Haven, Mich., laterals. On the Allegan lateral, Operation Stopple was used at six locations where low pressure valves had to be replaced. On the Grand Haven lateral, stopples were used to make seven such alterations to the original pipeline facilities. ■

Welders get ready to do their job.

Applying the final weld.

New section of line was purged of air and pressurized with gas fed from copper tubing shown in right foreground.

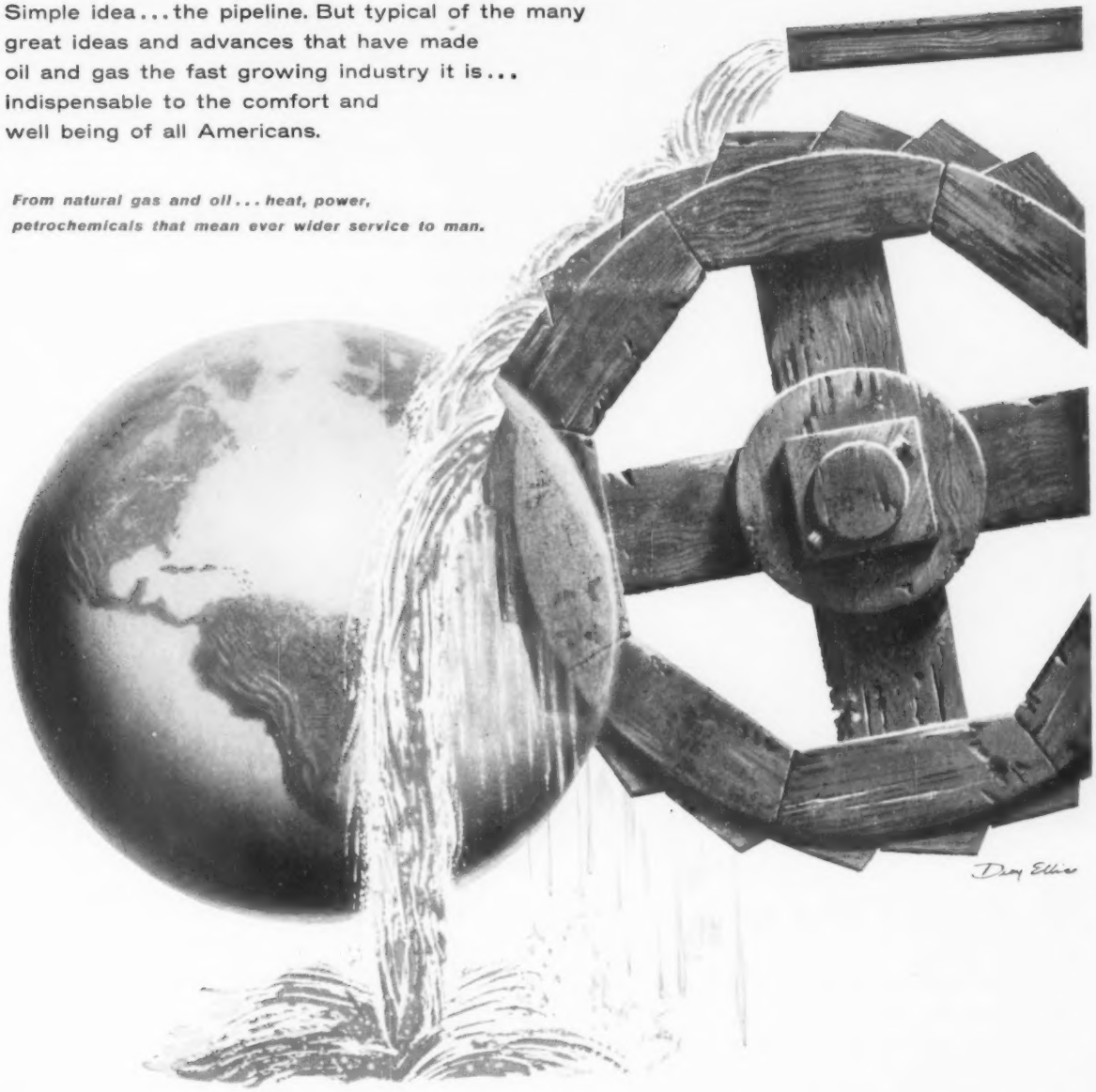
the world turns on an idea

Simple idea... the wheel.

By turning it with water, man made it produce power.
Today we harness energy... and far more of it... by pipeline.
Through this great underground highway, natural gas is carried
thousands of miles. Lifted over mountains, forced under rivers
to give homes and industry heat and energy never available before.

Simple idea... the pipeline. But typical of the many
great ideas and advances that have made
oil and gas the fast growing industry it is...
indispensable to the comfort and
well being of all Americans.

From natural gas and oil... heat, power,
petrochemicals that mean ever wider service to man.



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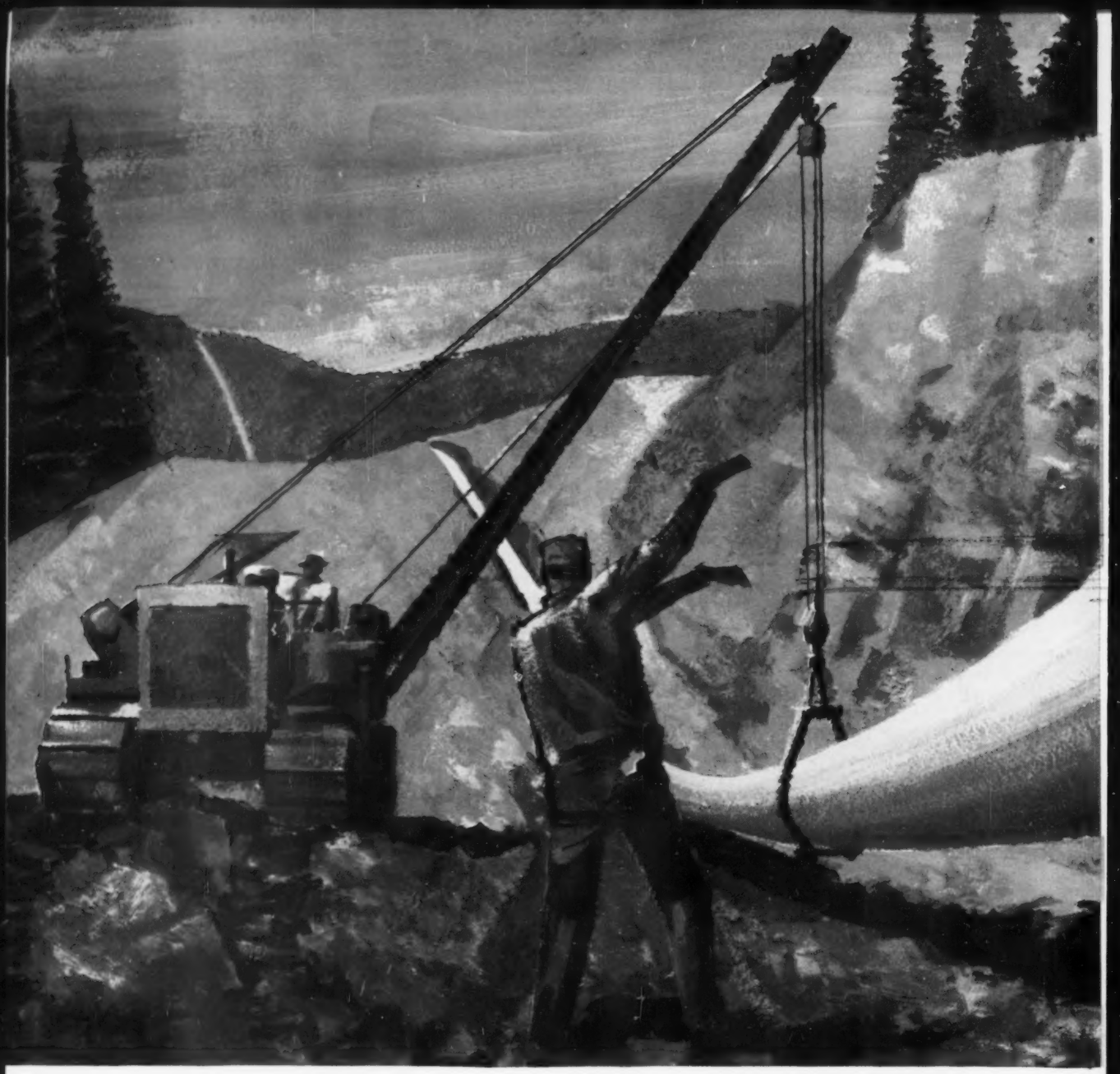
DIVISIONS: Tennessee Gas Pipeline Company · Tennessee Gas and Oil Company · Bay Petroleum Company
SUBSIDIARIES: Midwestern Gas Transmission Company · Tennessee Life Insurance Company · AFFILIATE: Petro-Tex Chemical Corp.



Putting a big one to bed

Line pipe must be laid with care. So it takes teamwork. And this sideboom operator and these men from the lower-in-gang have it. Their signals—precision-timed! Their reactions—cat-quick!

Experience? They've soaked up plenty. From the Arabian deserts to the plains of Argentina, and from the marshes of Louisiana's delta country to the granite hills of Maine. They know their line pipe! And they've learned that lines built with USS National Steel Line Pipe offer safe, economical service for countless years. *Why?* Because National Line Pipe has proven itself in installation after installation. It is consistently

specified for lines that handle gas, liquids and solids such as coal.

You'll find National Seamless Line Pipe available in a complete range of wall thicknesses, steel analyses and in diameters up to 26 inches—National Electric Weld Line Pipe up to 36 inches. For more information, write to National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

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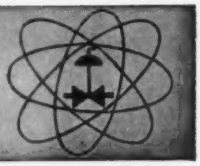
Communications and Automation



Edited by FRANK CHAPMAN

A new self-activating radio alarm

By F. VINTON LONG

This column should be read by gas dispatchers, measurement men, and people who would like to save money if their mainline has a break.

ONE of these objects which many of us have been talking about for a number of years but (as far as I know) none of us has done anything about, is a radio transmitter which will lay dormant during non-emergency periods and when something happens, come to life and transmit its message.

Some of the reasons we have not used these things up to now are:

1. They were too expensive.
2. They had a limited range if used on microwave frequencies.
3. They were not rugged enough to stand idle without inspection for long periods of time.
4. The lower VHF frequencies such as the 25 to 50 mc band was not open for use of such a device.
5. If the VHF band was open for such a device, the possibility of interference from foreign stations and subsequent erroneous triggering of the receiving station alarm made the scheme unsafe for practical use.
6. I guess we were all too darned lazy to do anything about it.

However, there is a man who has done something about it. He is Alden F. Wooster, superintendent of communications for Michigan-Wisconsin Pipe Line Co. in Detroit. He presented an excellent paper at the AGA Transmission Conference in Dallas on May 19, and first disclosed the use of this device.

One of the important factors which makes the use of such a device possible is the fact that there is now a frequency in the VHF band available. This frequency is 27 mc, in this case 27.275 mc, which is a "catch all" assignment recently authorized by the FCC for all comers.

The fact that the pipelines do not have exclusive use of this frequency, means that you can expect almost any kind of interference on it from any direction. A lot of precautions will have to be taken, but they are not too difficult in many cases.

The secret of successful operation with interfering stations as a possibility lies in the use of a multiple tone encoding system. The use of multiple tones is an old-established concept for tele-control of pipelines. One of the supervisory control equipment manufacturers specializes in this type equipment. It has been used for many years by pipelines and electric utility companies for error-free transmission of coded information such as tele-control of compressors.

Wooster suggests the use of FM in order to provide a lockout by the signal from the desired station against weaker signals from undesired stations. For the receiving end of the link he suggests that you use the most selective low internal noise receiver that you can find. In other words, he said, make sure your transmitter signal gets there "firstest with the mostest."

He recommends the use of vertical polarization for the antenna and shows a very tricky and well-designed, simple and cheap antenna which could be mounted on a telephone pole, on an existing radio tower, or on a microwave tower.

Wooster recommends the use of a dry nitrogen pressurized container to enclose a transmitter and the encoder, and in his experiment the whole thing was enclosed in a metal box which was bolted onto the side of the pole. In my opinion he is really cooking with gas with that concept and it brings me back to my old soap-box preaching of little black boxes for consistent communications.

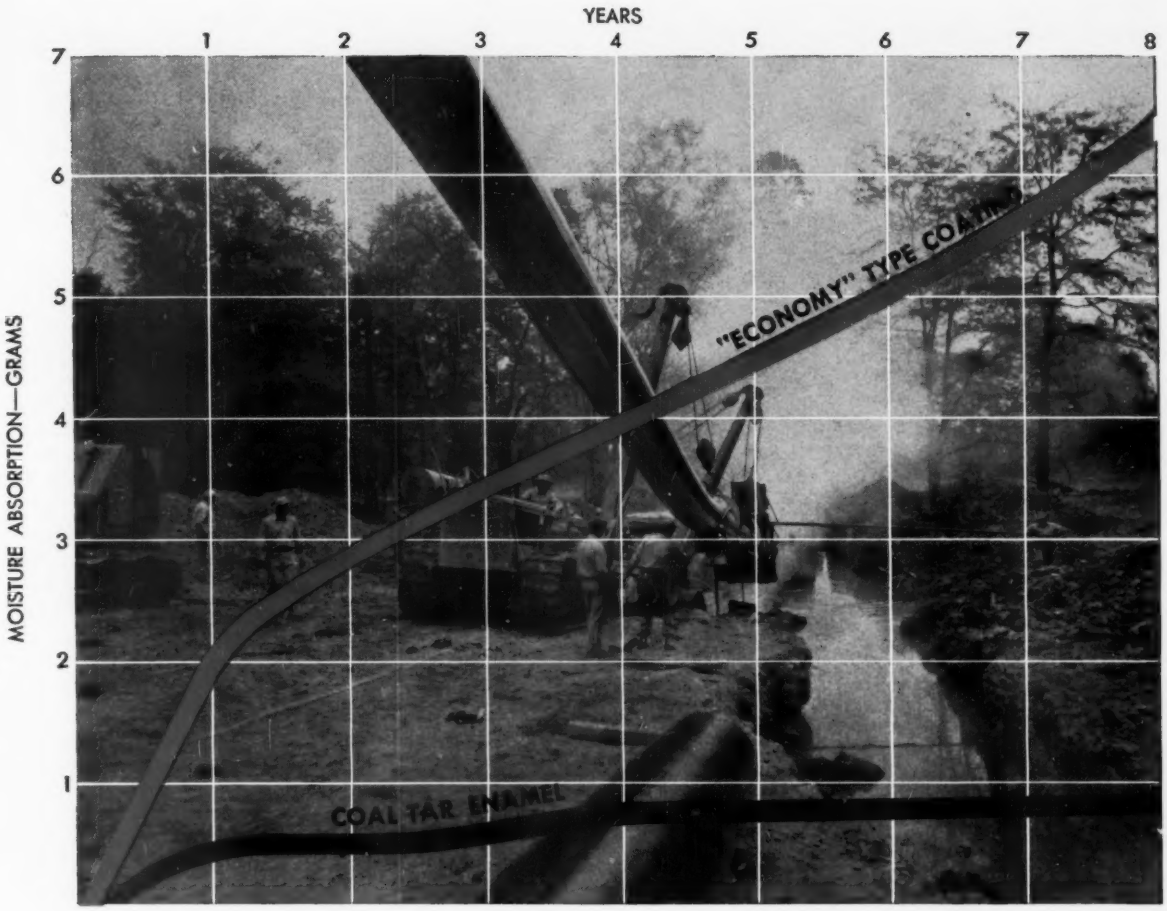
He advises the use of battery power with a floating trickle charger and either a semi-conductor inverter or a transistor power supply.

The unit should be tested at least once a week. This could be arranged by a visit of a maintenance man, a timing device, or if a receiver is also installed at the alarm point, the thing could be triggered by a "test request" signal dispatched to the point from the supervisor's office.

This test installation was on the Michigan-Wisconsin system. The test path is about 43 miles in length and so far has resulted in a reliability figure of 100 per cent during the short test period accomplished before Wooster presented his paper.

Fig. 1 shows the malfunction indicating alarm transmitter operating on 27.275 mc near Bristol, Ind. This station serves the Three

Continued on page 142



This Moisture Absorption Comparison Shows Why Most Pipelines are Protected with COAL TAR ENAMELS!

THE chart above, prepared by an independent pipeline engineer*, shows why an overwhelming majority of pipeline owners and operators select *coal tar enamels* to protect their underground investment. No other coating material can *begin* to match the ability of coal tar enamel to resist moisture absorption.

Field tests show that an "economy type" coating exhibits a constant moisture absorption increase. The continuously increasing cost of cathodic protection soon eats up any first-cost savings in material. Peeling and deterioration eventually require expensive reconditioning.

So why risk the chance of costly failures with an "economy" coating or other protection methods not *proved by time*? Specify PITT CHEM Coal Tar Coatings and be *sure* of economical, long-lasting protection.

PITT CHEM maintains a full-time staff of field service men to work with your field men in the efficient application of pipeline enamels. *Write us about your protection requirements . . . today!*

**Name upon request*

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★ PITT CHEM "Insul-Mastic"® Gilsonite-Asphalt Coatings
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PROTECTIVE COATINGS • COAL CHEMICALS • PLASTICIZERS • ACTIVATED CARBON • CEMENT • COKE • PIG IRON • FERROMANGANESE

communications • *Cont'd.*

from page 140

Rivers, Mich., lateral (Michigan Wisconsin Pipe Line Co.) from a tap on the American Louisiana Pipe Line. The pole transformer case contains the transmitter. Rectangular box on tower contains the school bell timer unit. It provides dual tones on hour repeated five times and single tones on half-hour repeated five times.

Fig. 2 shows one of the mainline automatic valve operators for which this equipment may also be used as a position and pressure monitoring device.

The transmitter is about 30 watts power which seems to give a very good signal over the 43-mile path with a simple directional antenna at each end of the path. The decoder is located in Detroit, about 300 system miles away on the microwave system.

Fig. 1. Malfunction indicating alarm transmitter.

Fig. 2. Mainline automatic valve operator.

This device serves for many useful functions. The one first contemplated by Wooster is to send an alarm to the gas dispatcher or his sub-office, or the nearest attended location, an alarm which will indicate that a sales meter or sales regulator has frozen up as often happens during the winter during critical periods. This could be carried out through a device which will automatically trigger the alarm transmitter if the discharge pressure from the regulator falls below a certain preset value. It could also be used as an alarm for an excessive value in case of regulator failure.

Another use for this device will be for emergency control of compressor stations either to send out an alarm signal from the compressor station or conversely to enable an operator to close down a remotely controlled station if the regular communication link fails for some reason. A one-time use of this link in an emergency might save destruction of a compressor or pump station—paying for the installation of these units throughout an entire pipeline system several times over.

Also an alarm transmitter could be installed at an unattended radio relay station, to send out an alarm if the microwave equipment becomes faulty or if the station goes on emergency power due to failure of the regular power. This would save the installation of drop and insert equipment at these remote points.

Still another use of this device would be at wellheads or other locations which would send out an alarm if something happens to the regulator or other instrumentation at that point.

This device would make practical the installation of unattended remote control devices at mainline block valves, which would close the block valves on a coded signal from a control station in the event of a line break. The first time that this is used would pay for the installation several times over, if only for the amount of gas saved from dispersal from the break, before repairs can be made.

I almost forgot to say that Wooster believes that this device will probably cost about $1,000 in its present form, although it might be later simplified and the cost reduced accordingly.

I think it is a darned good black box. ■

NCUR discusses utilities future use of radio

The future needs of utilities for the use of radio to conduct their business was stressed at the recent meeting of the National Committee for Utilities Radio in Denver.

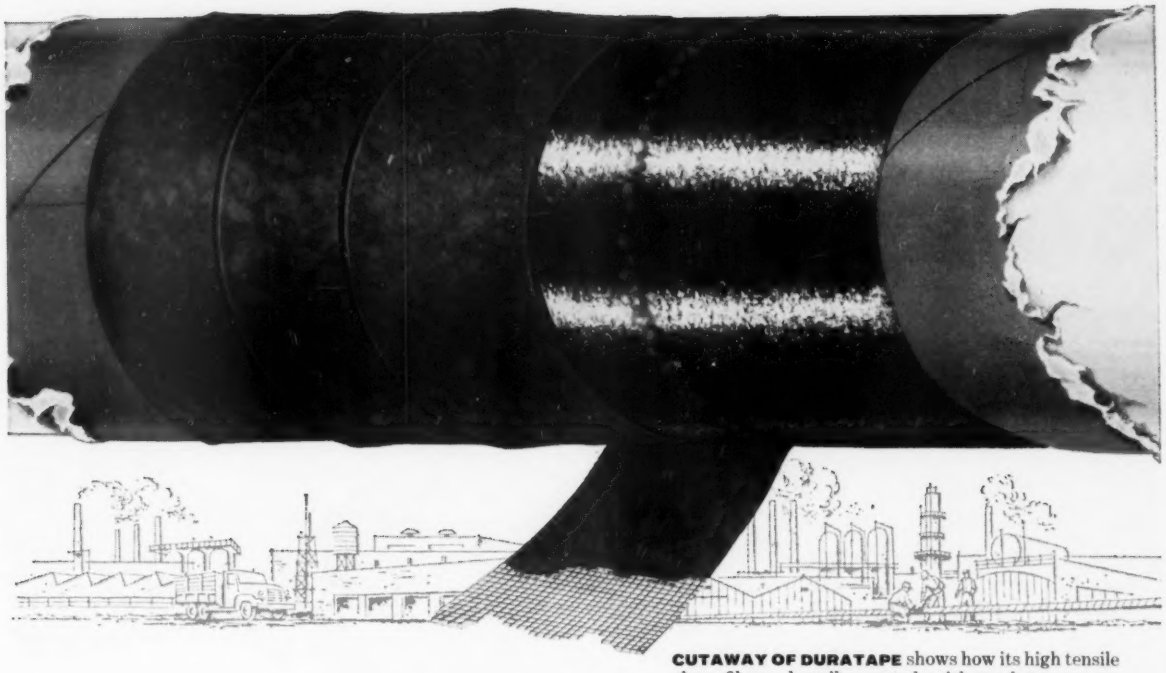
It was apparent in all talks that utilities plan to expand use of radio. And, they are determined to make plain their need for spectrum space. Using radio to improve and reduce cost of utility service is being studied.

During the year, NCUR testified before the FCC, which is reviewing allocations in the 25 to 890 mc regions of the radio spectrum (Docket 11997). The committee believes spectrum space for 6000 channel assignments will be needed by utilities in the next ten years. Present total is about 2300.

Frequency coordinators report that the change to reduced deviation, in preparing for full narrowband operation in the 42 to 50 mc and 150 mc portions of the spectrum, has been accomplished with very little complaint from users.

NCUR hopes the FCC will soon approve the use of tones in mobile frequencies for signaling, alarm, and miscellaneous control. It was also revealed that there are many unattended transmitters for giving alarms in case of failure of essential parts of utility systems.

Officers to serve the coming year are: chairman, Wesley C. Baylis, Niagara Mohawk Power Corp., Albany, N. Y.; vice chairman, Harold Backen, Jr., Douglas Electric Cooperative Inc.; and secretary, C. O. Diller, Lone Star Gas Co., Dallas.



CUTAWAY OF DURATAPE shows how its high tensile glass fibers, heavily coated with coal tar or asphalt, provide an extremely durable dielectric shield.

Mill-wrapped pipe lasts only as long as its joints... that's why

more and more companies use Johns-Manville Duratape® to protect pipe joints

QUICK, EASY APPLICATION. Simply wrap primed joints with Duratape . . . flash-seal with low-temperature torch during and after application. Wrap can be similarly applied to elbows, tees and other pipe fittings.

J-M Duratape Joint Wrap is designed to give pipe joints the kind of protection they need to live as long as the rest of the pipe. It forms a tough dielectric barrier with excellent resistance to corrosive elements.

Made of high tensile glass fibers, and heavily coated with coal tar or asphalt, Duratape forms a tight bond with the pipe and a lasting seal against corrosion. In many years of actual use, this combination of inorganic glass fibers with coal tar (or asphalt) has proved to be far superior to organic base tapes.

Duratape is also fast and easy to install. This, plus its initial low cost, permits extensive savings on joint-wrapping. No problem with tearing, either, because of its strong, reinforcing glass fibers.

Your nearby Johns-Manville representative has samples and complete information. Contact him, or write to Johns-Manville, Box 158, New York 16, N.Y. In Canada, Port Credit.

WHEN ORDERING mill-wrapped pipe, be sure to specify the J-M "Partners in Pipeline Protection"... Blue Flag® Fiber Glass Wrap for enamel reinforcement with an outer shell of J-M Asbestos Felt . . . for *complete* pipe protection.

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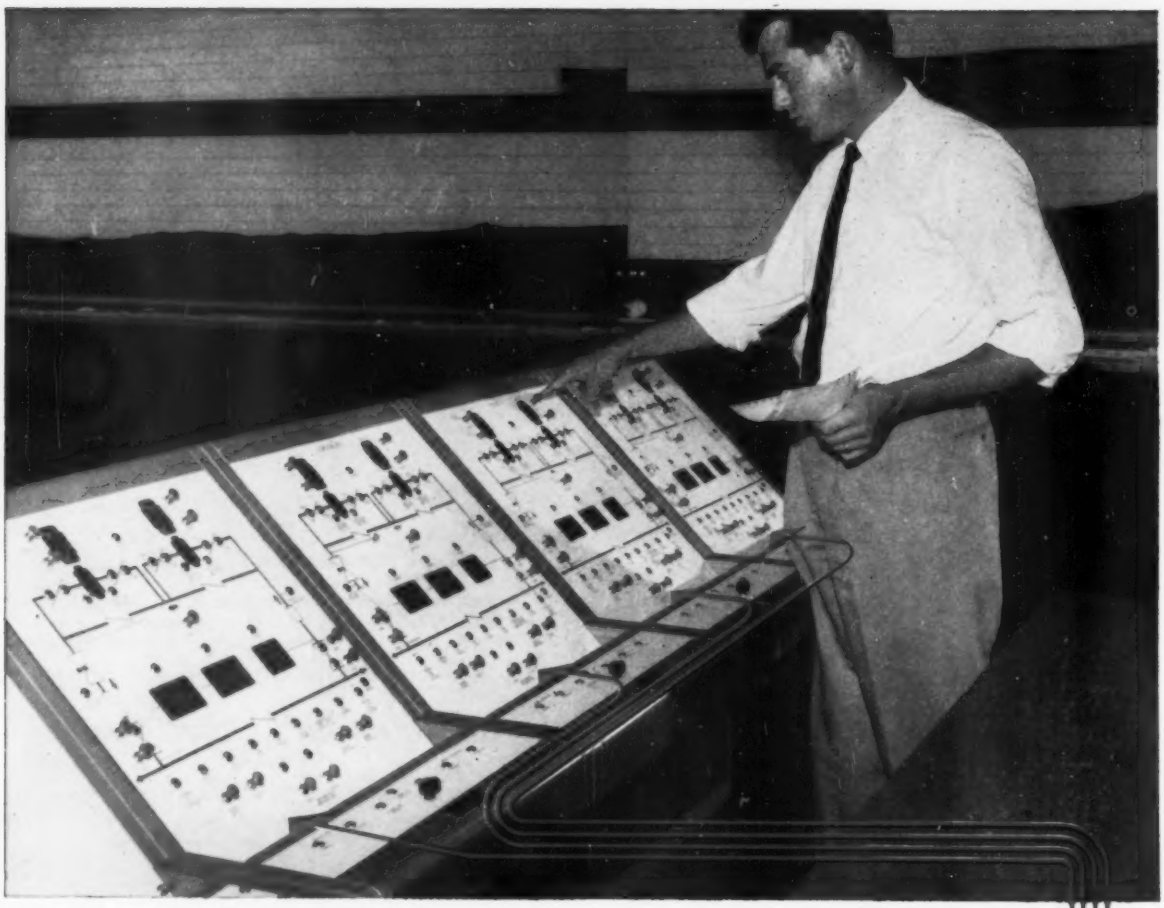
Union Centralized Transport Control pays



LOS ANGELES CONTROLLING OFFICE—The heart of the whole operation is in Los Angeles where one man at the control console can supervise the operation of four unattended pump stations 643 to 804 miles away. The operator has complete information before him showing conditions all along the line.

PHOENIX
Output Terminal

TUCSON
Output Terminal

APACHE
Unattended Booster Pump Station

REMOTE CONTROL—Either pumping unit at any one of the four booster stations can be started or stopped from Los Angeles. The sequence in opening and closing valves and starting and stopping pumps is all handled automatically and correctly by the control system.

off for Southern Pacific Pipe Lines

Push a button in Los Angeles and four pump stations throb into action out on the desert over 600 miles away

Union Switch & Signal equipment controls operating sequence and telemeters operation of 33,000 bbl/day products line

FLEXIBILITY and fail-safe operation are the keynotes of the new pipeline system operated by Southern Pacific Pipe Lines, Inc. The line is used to transport refined products such as gasoline, jet fuel, diesel oil, etc., from El Paso, Texas, to Tucson and Phoenix, Arizona. All Centralized Transport Control equipment for four unattended booster stations was supplied by Union Switch & Signal.

REMOTE or LOCAL: All four booster stations are normally controlled from Los Angeles. Any station can be controlled locally, when desired. In any case, continuous pressure and suction readings are displayed on the console at Los Angeles and automatically recorded every fifteen minutes by an automatic typewriter. Any malfunction, at any point in the system, is indicated on the console. The equipment affected is shut down automatically and cannot be started again until the trouble has been cleared.

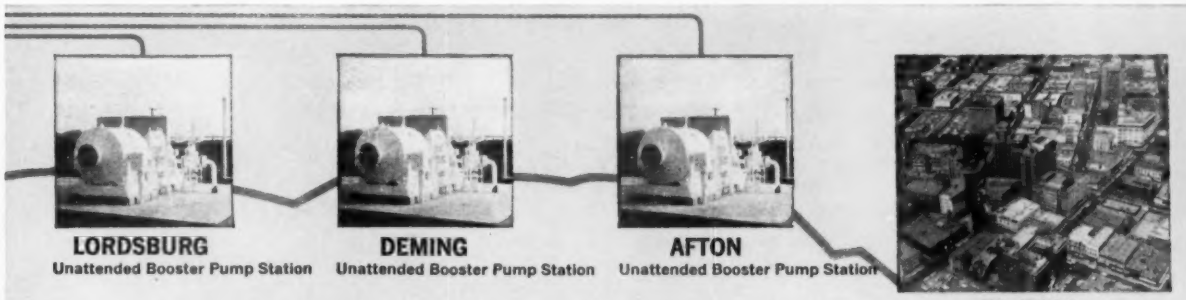
COMMUNICATION: Four telegraphic-type communications lines, owned by Southern Pacific, are used to transmit control codes to the stations and telemetered information back to Los Angeles. Each line serves one station. An additional commercial communications line serves as a stand-by for all four stations. Signals are coded to prevent noise or interference from causing faulty operation or indication.

MAXIMUM EFFICIENCY: The Centralized Control system, designed and installed by Union Switch & Signal Division of Westinghouse Air Brake Company, cuts down the chance for expensive error. It keeps the Southern Pacific Scheduling Department in Los Angeles informed, at all times, of exactly what is happening in the field. It speeds operation, adds security and reliability.

Union Switch & Signal has designed many successful custom systems for pipeline companies. And now out of that experience, it has developed standardized central control systems that cut costs, add flexibility, and save space, as well as making pipeline control extremely reliable.

"Pioneers in Push-Button Science"

UNION SWITCH & SIGNAL
DIVISION OF WESTINGHOUSE AIR BRAKE COMPANY
PITTSBURGH 18, PENNSYLVANIA



LOCAL CONTROL—Operation also can be controlled automatically at the pump station. Or the station can be run manually. The choice is up to the local station. But Los Angeles always knows which mode of control is being used and always receives a continuous flow of system information.

THE FUTURE—Southern Pacific Pipe Lines, Inc. can already see opportunity to make this system more automatic and more efficient. They plan, in time, to be able to let stations adjust automatically to proper unit operation when an upstream or downstream station goes off the line.

More than two thousand

EPON® resin internal coatings for give lower maintenance costs

... *plus 5% more through-put*

EPON RESIN-BASED internal coatings are making pipeline history *right now* . . . by lowering maintenance costs, speeding gas flow and minimizing the expensive annoyance of scale-jammed valves.

Among the toughest, most durable plastics known to modern chemistry, Epon resin has an outstanding record in surface coatings that protect against corrosion, depositions, scaling and paraffin build-up. Enamels based on Epon resin have remarkable adhesion, excellent resistance to impact and abrasion, and the ability to withstand the attack of corrosive chemicals.

The smooth, uniform surface of Epon resin internal coatings permits greater through-put, makes possible reduced compressing costs—and helps to deliver cleaner gas products. More than 2 thousand miles of Epon resin-coated pipeline are in service, giving good performance under varying operating conditions.

Easy-to-apply with specially designed interior coating equipment, Epon resin coatings cause less wear and tear on the pig . . . give you *clean* pipe on start-up. Old lines can be coated while still in place with specially developed underground equipment. Still another bonus—the bright surface of the Epon enamel coat reveals structural defects in the pipe that otherwise might be overlooked.

Get complete information on this revolutionary pipeline development by contacting your nearest Shell Chemical office.

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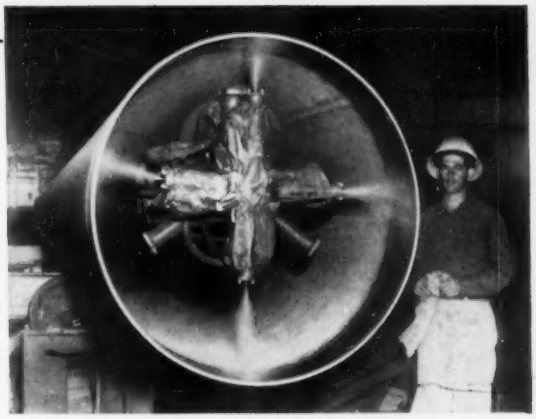
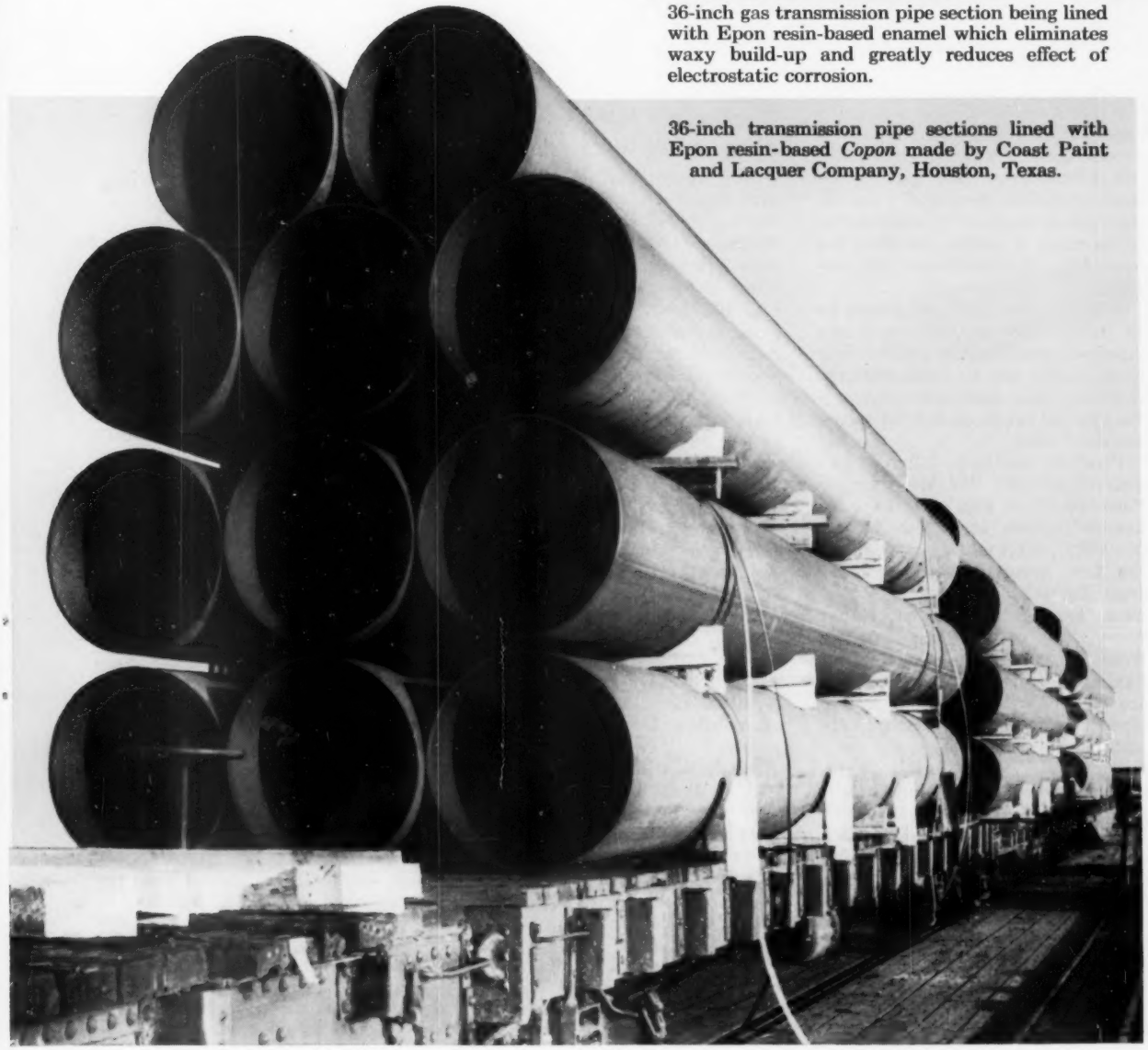
miles in use!

gas pipelines



36-inch gas transmission pipe section being lined with Epon resin-based enamel which eliminates waxy build-up and greatly reduces effect of electrostatic corrosion.



36-inch transmission pipe sections lined with Epon resin-based *Copon* made by Coast Paint and Lacquer Company, Houston, Texas.

GAS • PIPELINE NEWS

Transwestern approved; price-conscious FPC imposes conditions

Early in August, FPC approved Transwestern Pipeline Co.'s plan to bring a new gas supply to southern California. Transwestern will build a $191.7 million system to move 308 MMcf daily to the California border near Topock, Ariz.

With the Supreme Court's warning on rates in mind, the commission imposed rate conditions on the Transwestern project. These conditions include: Adjustments in rates to reflect the reduced cost of its gas supply resulting from initial rates imposed on suppliers; a separate rate schedule for sale of excess gas; a modified minimum bill eliminating "the high minimum provisions proposed"; and an increase in commodity components of its rates, if desired, to offset the loss of the high minimum bill provision.

FPC also granted certificates to 14 independent producers and one pipeline company, authorizing them to sell gas to Transwestern. However, they were directed to reduce initial prices on several of the proposed sales.

Producer contracts fall into two general groups: The west Texas-Permian Basin area and the Panhandle-Hugoton area. Out of the 308 MMcf, 211.4 million comes from the first group and 96.5 million from the other. Contracts in the west Texas-Permian Basin area provide for initial prices ranging from 12 to 21.8 cents per Mcf. Panhandle-Hugoton's initial prices are 23 cents. Sale price from the pipe line company is 21 cents. Certification of these rates, the commission said, would result in an annual increase of $17.8 million in the price California consumers pay for gas.

Price reductions ordered: Gulf Oil Corp. from 12 to 11 cents per Mcf; Richardson & Bass, from 21.8 cents to 18; Union Oil Co. from 20 cents to 16 for Eddy county, N. M., sales and from 23 to 17 cents in the Panhandle-Hugoton area; and Warren Petroleum from 23 to 17 cents.

New rate filing by Transwestern must reflect these lower rates.

Transwestern's system will have some 1809 miles of line and 40,890 hp in compression.

Pacific Lighting Gas Supply Co. plans to buy the gas from Transwestern at the California-Arizona border and sell it to its affiliates, Southern California and Southern Counties Gas companies. PLGS has state PUC approval to build a line to transport the gas.

Northern's Midwest plan okay, with lower rates

FPC approved of Northern Natural Gas Co.'s plan to bring gas service to 342 communities in the Midwest (Dockets G-17485 et al). Also approved was a companion filing of Iron Ranges Natural Gas Co., St. Paul. Iron Ranges will build a pipeline system in Minnesota to serve 28 communities and several industries.

FPC imposed rate conditions on both companies. Northern proposed two new rate zones: Zone B with a demand charge of $3.81 per Mcf and a commodity charge of 23.4 cents per Mcf; and Zone C, with a demand charge of $4.12 and a commodity charge of 23.9 cents. Northern got a demand charge of $2.91 and $3.23 and a commodity charge of 25.97 and 26.47 cents for Zones B and C respectively.

Also approved were plans of El Paso Natural, Permian Basin Pipeline, and Phillips Petroleum, all relating to Northern's gas supply.

Northern will build 430 miles of 20-, 24-, and 30-in. mainline; about 2178 miles of branch lines; 303 town border stations; and 57,400 hp in added compressor capacity. This latter includes new stations at Waterloo, Iowa, and Farmington, Minn. Cost is expected to hit $114.6 million.

Iron Ranges' 180-mile system will cost about $7.6 million. Pipe will range from 3 to 12 in.

FPC had some reservations about Northern's gas supply.

On any future plans to hike its system sales capacity, Northern must show that the average well in the Hugoton field can sustain the rates of production used in Northern's deliverability studies.

Northern estimates a third-year contract demand volume of 230.9 MMcfd and an annual sales volume of 82 billion cu ft. Its rate of return on the entire system would be in excess of 6½ per cent.

Evidence showed that coal interests strongly intend to compete with Northern and Iron Ranges in supplying fuel needs of the major industrial and utility plants in the area. However, the FPC said it did not feel justified in denying authorization merely because of competition. It said there was no reason to assume that Northern and Iron Ranges would lose their markets for interruptible gas or not be able to find substitute buyers.

Committee seeks solution to producer problem

Legislation that will help solve the "worsening problem" of producer regulation is the goal of a special committee set up by the Independent Petroleum Association of America.

The 9-man study group is a subcommittee of the IPAA's larger natural gas committee.

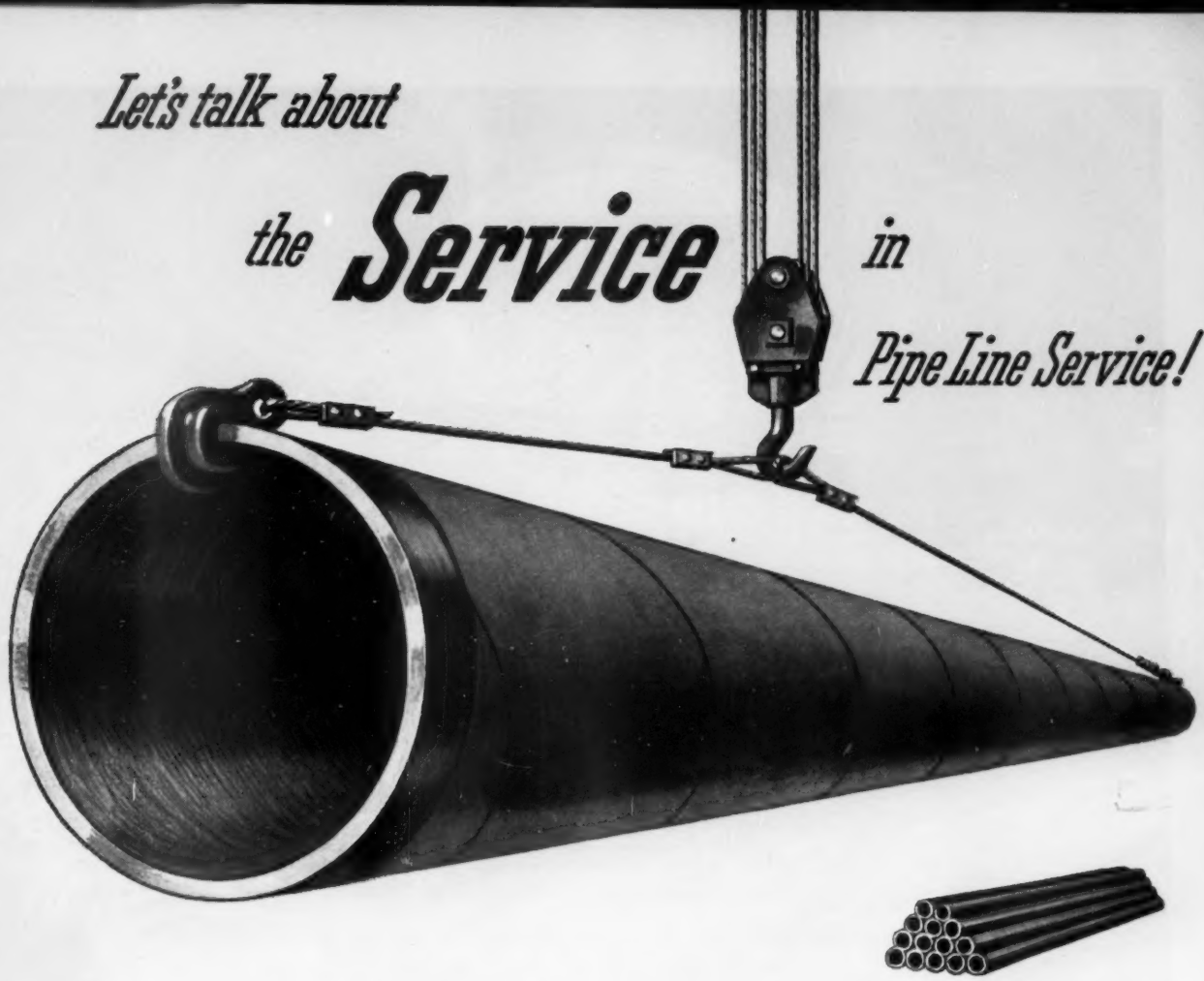
IPAA president Gordon Simpson said recent court rulings "have compounded the confusion and chaos" facing both gas producers and FPC.

"As a result of recent decisions . . . the industry, the government, and the consumer . . . face one of two alternatives," Simpson said. ". . . Attempt to regulate the local gas producer on a utility basis, which has proved impractical if not impossible. Or support corrective legislation which will permit the industry to continue finding and developing gas supplies required by our expanding economy."

"Unless there is soon a coalescence of all views and interests which will permit corrective gas legislation, the government will find itself with a hopeless task; the discoverer of new gas will be discouraged by the burdens of regulation from selling in the interstate market; and thousands of consumers will be denied a fuel for which there is an increasing demand."

Continued on page 156

Let's talk about the **Service** *in Pipe Line Service!*



A company doesn't become a leader through quality of product alone. Although Pipe Line Service through the years has proved consistently that quality depends on coating and wrapping under controlled plant conditions, *service* is half the battle.

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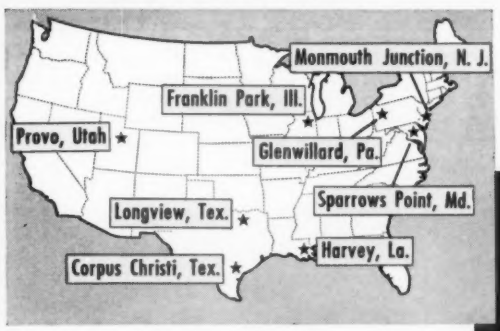
All this, *plus* the service of a PLS representative when needed. It's his job to help you in the proper handling, storage and laying of PLS protected pipe, to give you the maximum return on your investment.

This combination of quality *and* service assures you of the finest in pipe protection. On your next coating job call in your nearest PLS representative—you'll find that he can save you time, trouble and money.

There's a PLS plant strategically located to serve YOU!



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Pipe Line Service Corporation

FRANKLIN PARK, ILLINOIS

Quality pioneers in coating and wrapping pipe for a quarter century

A SUBSIDIARY OF AMERICAN STEEL FOUNDRIES

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Also approved were plans of El Paso Natural, Permian Basin Pipeline, and Phillips Petroleum, all relating to Northern's gas supply.

Northern will build 430 miles of 20-, 24-, and 30-in. mainline; about 2178 miles of branch lines; 303 town border stations; and 57,400 hp in added compressor capacity. This latter includes new stations at Waterloo, Iowa, and Farmington, Minn. Cost is expected to hit $114.6 million.

Iron Ranges' 180-mile system will cost about $7.6 million. Pipe will range from 3 to 12 in.

FPC had some reservations about Northern's gas supply.

On any future plans to hike its system sales capacity, Northern must show that the average well in the Hugoton field can sustain the rates of production used in Northern's deliverability studies.

Northern estimates a third-year contract demand volume of 230.9 MMcfd and an annual sales volume of 82 billion cu ft. Its rate of return on the entire system would be in excess of 6½ per cent.

Evidence showed that coal interests strongly intend to compete with Northern and Iron Ranges in supplying fuel needs of the major industrial and utility plants in the area. However, the FPC said it did not feel justified in denying authorization merely because of competition. It said there was no reason to assume that Northern and Iron Ranges would lose their markets for interruptible gas or not be able to find substitute buyers.

Committee seeks solution to producer problem

Legislation that will help solve the "worsening problem" of producer regulation is the goal of a special committee set up by the Independent Petroleum Association of America.

The 9-man study group is a subcommittee of the IPAA's larger natural gas committee.

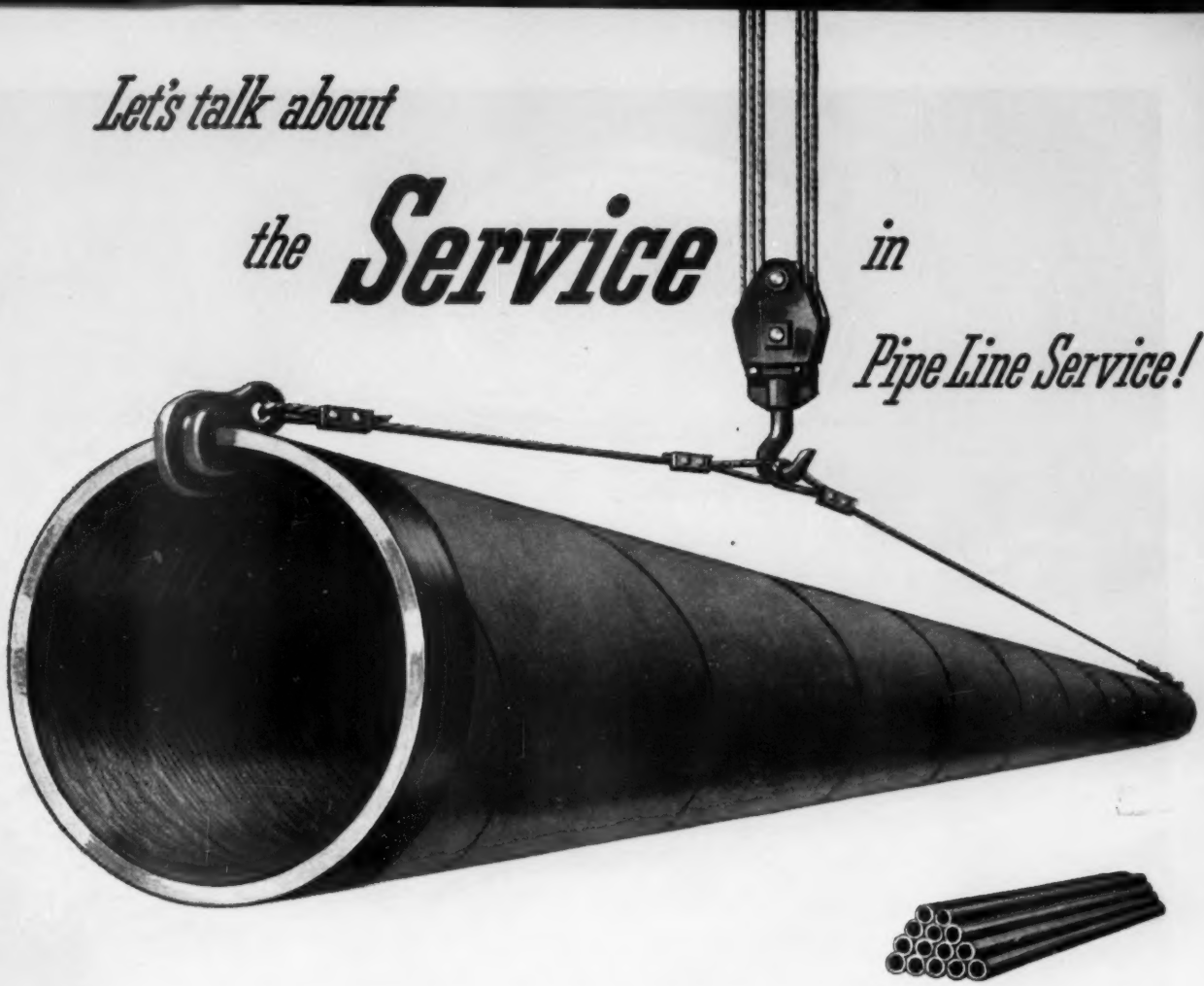
IPAA president Gordon Simpson said recent court rulings "have compounded the confusion and chaos" facing both gas producers and FPC.

"As a result of recent decisions . . . the industry, the government, and the consumer . . . face one of two alternatives," Simpson said. ". . . Attempt to regulate the local gas producer on a utility basis, which has proved impractical if not impossible. Or support corrective legislation which will permit the industry to continue finding and developing gas supplies required by our expanding economy."

"Unless there is soon a coalescence of all views and interests which will permit corrective gas legislation, the government will find itself with a hopeless task; the discoverer of new gas will be discouraged by the burdens of regulation from selling in the interstate market; and thousands of consumers will be denied a fuel for which there is an increasing demand."

Continued on page 156

Let's talk about the **Service** *in Pipe Line Service!*



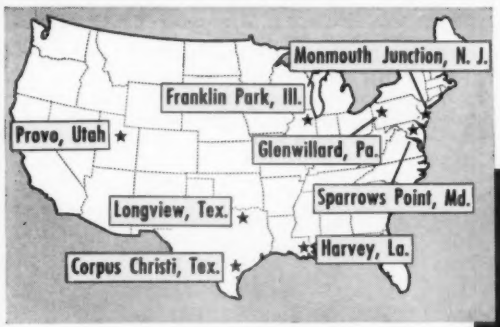
A company doesn't become a leader through quality of product alone. Although Pipe Line Service through the years has proved consistently that quality depends on coating and wrapping under controlled plant conditions, *service* is half the battle.

By service, we mean storing your pipe at plants strategically located near your sources of supply . . . and large storage facilities to allow you to purchase pipe when delivery is most favorable. Your pipe will be held in storage until needed—and then coated under the PLS high standards of uniformity. You *always* get a freshly applied coating job at the time pipe is ready to be laid. And PLS will ship your protected pipe *where* you want it . . . *when* you want it!

All this, *plus* the service of a PLS representative when needed. It's his job to help you in the proper handling, storage and laying of PLS protected pipe, to give you the maximum return on your investment.

This combination of quality *and* service assures you of the finest in pipe protection. On your next coating job call in your nearest PLS representative—you'll find that he can save you time, trouble and money.

There's a PLS plant strategically located to serve YOU!



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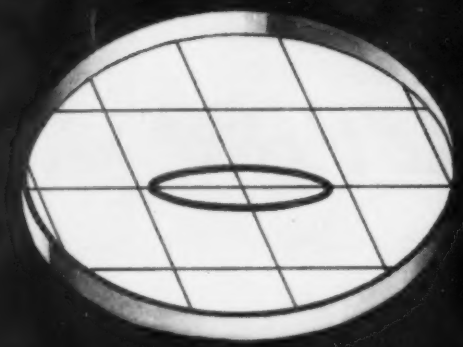
Pipe Line Service Corporation

FRANKLIN PARK, ILLINOIS

Quality pioneers in coating and wrapping pipe for a quarter century

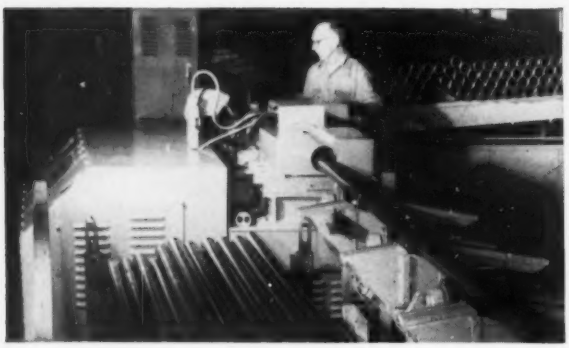
A SUBSIDIARY OF AMERICAN STEEL FOUNDRIES



You saw it at the International Petroleum Exposition...

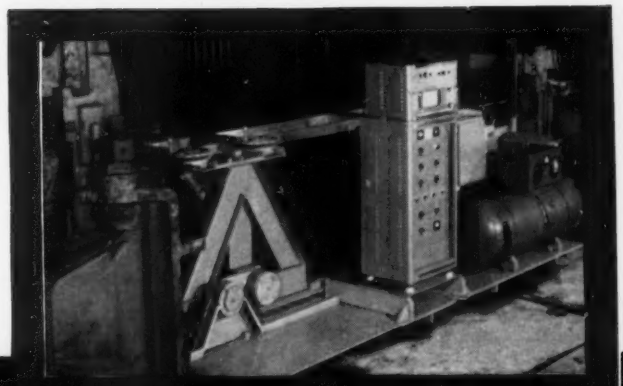
FARROWTEST

The unique inspection method that uncovers injurious defects frequently missed by other testing devices. The exclusive eddy-current test that assures top dependability. The first and only non-destructive test to offer quality you can measure!



FARROWTEST is a proved and established safeguard. It has been used by Republic with complete success in the production of hydraulic tubing, boiler tubes, and tubular products for other critical uses for years, as pictured above.

A PROVED PERFORMANCE SAFEGUARD— FARROWTEST's unlimited sensitivity can be calibrated to detect and reject harmful line pipe defects. Only pipe that meets established quality requirements will be delivered.



...for quality you can measure!

FARROWTEST®—Exclusive with Republic Electric Resistance Weld Line Pipe—will benefit *you*. Here is a process that uncovers hidden defects missed by other testing methods. It is the only non-destructive test that provides you with quality you can measure. It acts independently of the observation, judgment, or opinion of the operator.

It's a fact. FARROWTEST's unlimited sensitivity can be calibrated to detect and reject harmful line pipe defects. Unveiled by Republic at the International Petroleum Exposition, FARROWTEST amazed onlookers by detecting invisible yet critical defects in stainless and carbon steel samples.

FARROWTEST is a *proved* production safeguard. It has been used by Republic with complete success in the production of tubular products for other critical uses. Its application to line pipe production for scientific quality control follows years of comprehensive research and development. In its application to line pipe, FARROWTEST will not initially displace the conventional standard tests. Such tests will continue as supplementary tests.

What it means to you is top dependability in the field. With FARROWTEST, only pipe that *meets* established quality requirements will be delivered. Utmost uniformity—a characteristic of Republic Electric Resistance Weld—remains unchanged. FARROWTEST is a non-destructive process. You will continue to enjoy accurate line-up of joints, smooth bending in field or shop, uniformly high yield strength and ductility.

Learn more about FARROWTEST—the most important line pipe advance of the decade. Write Republic Steel Corporation, Dept. GS-7914, 1441 Republic Building, Cleveland 1, Ohio.

REPUBLIC STEEL

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World's Widest Range of Standard Steels and Steel Products

Exterior view of Utica Station.

The three compact 6-cylinder Cooper-Bessemer GMVC Compressors are rated 1000 hp at 300 rpm. Two have been in service since 1957. One was added in 1959.

Victor G. Fulkerson, *Head Engineer, Utica Station, New York State Natural Gas Corporation, explains...*

How the new Utica Station meets growing demands with Cooper-Bessemer Compressors

"Our Utica Station was built in 1957 to boost gas pressure for the mounting demands of the Albany-Schenectady area. It housed two 1000 hp Cooper-Bessemer Series-Turbocharged V-Angle Compressors. Then, a demand for 20 million cubic feet more gas daily required the addition of a third unit of the same type and size this year (1959).

"Averaging about 85 million cubic feet per 24 hours, the station has pumped peak loads of as much as 140 million cubic feet. Entering the station at 400-700 psi, the gas is discharged at 600-900 psi."

FACTS ABOUT COOPER-BESSEMER SERIES-TURBOCHARGED V-ANGLE COMPRESSORS

Peak Load—Plus Capacity. Plenty of reserve power, always ready for those unexpected extra demands, provides a big economy advantage.

Low Fuel Consumption. Guaranteed not to exceed 7200 Btu/bhp-hr at full load!

Less Housing Cost. Compact V-angle design, combined with 40% power increase of series turbocharging, means today's highest power-to-space ratio, with no increase in piping or cooling requirements.

Minimum Oil Consumption. Cooper-Bessemer "cocktail-shaker" piston cooling, precision-honed cylinders, and advanced piston and ring design, combined with highly efficient, full-flow filtration, results in exceptional lube oil economy.

Low Maintenance. Many factors contribute to records of trouble-free performance—the simplicity of V-angle 2-cycle design, fewer moving parts, accessibility, conservative ratings, and, extremely significant, vibrationless operation.

Write For Bulletins. Complete details on Cooper-Bessemer V-Angle Compressors are given in bulletins... free on request. Call our nearest office to help you plan new facilities.

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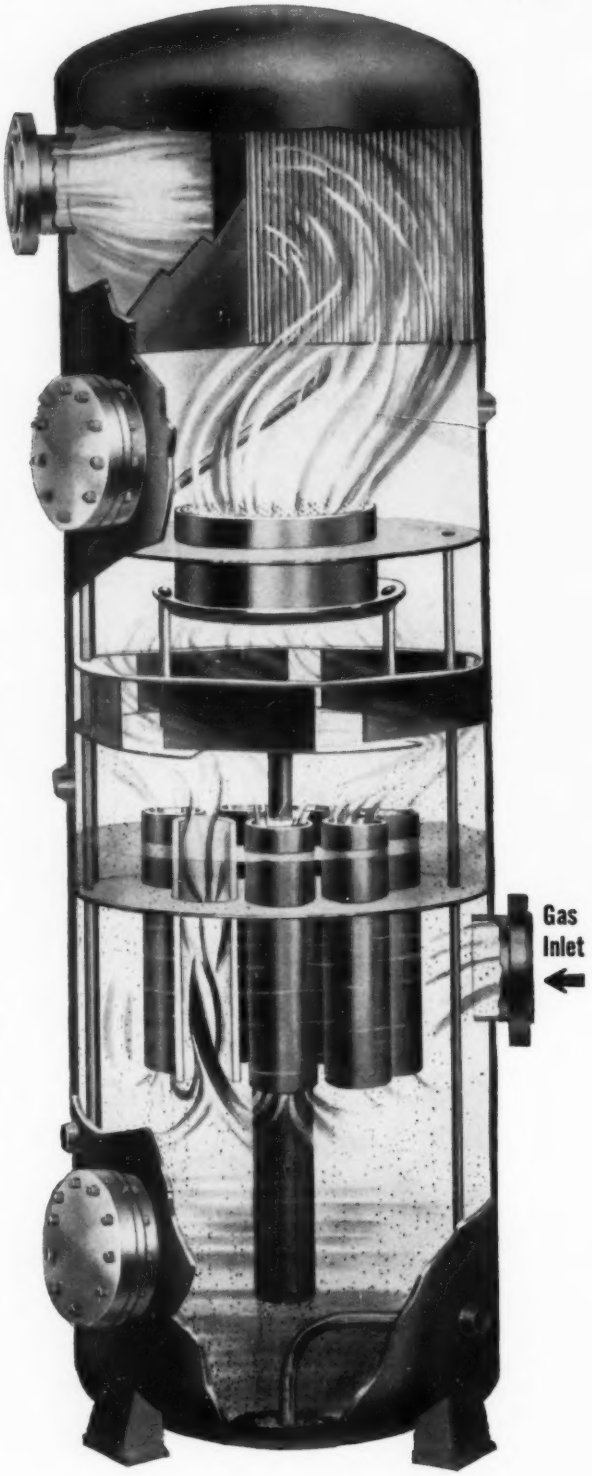
NEW BLAW-KNOX "M-P" (multi-phase) GAS CLEANERS handle high volumes . . . extreme load swings

"M-P" MEANS MORE PHASES OF GAS SCRUBBING AND OIL SEPARATION

4 PHASES OF GAS SCRUBBING give better contact between gas and scrubbing liquid

6 PHASES OF SEPARATION of oil from gas assure less entrainment than ever before



- reduces number of cleaners needed; cuts down on piping foundations and oil handling facilities.
- limits oil loss to .02 to .03 gallon per million standard cubic feet of gas.
- removes virtually 100% of particles greater than 3 microns, 80% of sub-micron particles.
- efficient separation is maintained throughout high and low flows.
- available in 18" to 72" diameter models; capacities to 18,000,000 standard cubic feet per hour at 1000 psig, and for any desired design pressure.
- see how this revolutionary new gas cleaner can provide complete dust-erosion protection to compressors, regulators, and metering equipment. Write for details.

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Buflovak Equipment Division
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IT TAKES LESS THAN 500 MANHOURS TO INSTALL A **FIN-PAK®**

Dual Fin-Pak heat exchangers at El Paso Natural Gas Company's compressor station at Caprock, New Mexico. The two 5,000-hp gas turbines at the Caprock station pump an average of 12,000 CFM, 24 hours a day.

Fin-Pak's prefabricated design, light weight and compactness cut installation time and labor costs to a minimum. On a typical 5,000-hp gas turbine cycle, for example, fewer than 500 manhours are required for *complete* installation of a Fin-Pak.

And installation economies are just the beginning. In operation, a Fin-Pak can cut your fuel bill by as much as 32%*, because it recovers up to 80% of the heat from the turbine exhaust and returns it to the combustion air.

And maintenance is a cinch with the Fin-Pak. It has short, straight-through passages. Occasional cleaning with compressed air is *all* the maintenance a Fin-Pak needs. **One last thought:** a gas turbine station requires about 80% *less* plant maintenance personnel than a station of equal capacity operating diesels, steam turbines or gas engines. For complete details, call or write Air Preheater.

*A Fin-Pak with a designed efficiency of 75% in a gas turbine cycle at 6 to 1 pressure ratio and a turbine inlet temperature of 1500°F.

THE AIR PREHEATER CORPORATION

60 East 42nd Street, New York 17, N. Y.

pipeline news • *Cont'd.*

from page 148

Oklahoma gas for in-state use if Lone Star denied

Lone Star Gas Co., Dallas, can connect its system with new major gas reserves in the Knox field of Grady county, Okla.

Presiding Examiner Emery Woodall, under Docket G-17897 et al, authorized 10 producers to sell gas to Lone Star. Initial price is 16.8 cents per Mcf, including a Btu and tax reimbursement adjustment.

Metering and dehydration facilities will be built by Oklahoma Natural Gas Co., slated to receive one-half of the Knox gas. Lone Star gets the other half. If FPC okays it, Lone Star will assume half ownership of the facilities. If not approved by Nov. 1, the entire gas supply will go to Oklahoma Natural for intrastate use only.

Examiner Woodall said the evidence proved Lone Star's need for the new reserves to meet present and future requirements. Testimony showed Knox reserves could be in excess of a half trillion cu ft.

FPC staff counsel earlier asked that the certificates be denied. He contended that the plan would cause the consuming public "to suffer and to continue to suffer" economic detriment. Woodall rejected this claim.

Woodall cited the Supreme Court's recent ruling in the CATCO case. He declared the record clearly showed that the very evidence the court said was lacking in the CATCO case "was forcefully presented and uncontradicted in this proceeding."

The examiner pointed to the "crystal clear" evidence showing that the Knox Field gas had been dedicated to an intrastate market if acceptable certificates are not issued within a stipulated time.

Urea plant using 9 MMcfd

Among raw material needs at the East Coast's first urea plant is 9 MMcf of gas daily. The gas will come from Sun Oil Co.'s gas fields in southwest Texas. It will be delivered through Transcontinental Gas Pipeline Corp.'s system.

The plant is an $8 million joint venture of Sun Oil and Olin Mathieson Chemical Corp. Plant site is North Claymont, Del. Annual urea production will be 73,000 tons. It will also produce about 10 million cu ft of hydrogen for use by Sun to produce ammonia and for other refining processes.

In-the-ditch guarantee offered

In-the-ditch performance of its pipe enamel is being guaranteed by Gulf States Asphalt Co., Houston.

Covered is the company's Pipe Primer 474 and Pipe Enamel 434 when applied to transmission, product and gathering lines. Not covered are lines within metropolitan areas.

The guarantee is for a minimum period of 10 years. Company technicians project that when the line is in good condition at the end of 10 years, the effective life of the enamel is indefinite.

To effect the guarantee, the following conditions must be met:

1. Application of coating is in accordance with NACE and good pipeline practice.

2. Handling of backfill is in accordance with good pipeline practice. Rock shield and padding are used where needed.

3. All bare lines or other contacts with metal are isolated by adequate electrical insulation.

4. Protection provided by enamel is supplemented by proper and adequate cathodic protection.

5. Mechanical damage or exposure to foreign contacts, line taps, leak repairs, and/or damage occurring through Acts of God are not covered. The material is specifically guaranteed against soil penetration and stress, loss of bond, abrasion from normal handling; temperature shock damage, cold flow and cracking; puckering after application or wrinkling; water transmission, moisture vapor transmission, age deterioration; leaching, soil chemical attack, normal electrolysis, bacteria; insects, fungus, vegetation roots, burrowing animals, and other natural hazards.

6. Full cooperation is to be extended Gulf States Asphalt engineers in making periodic inspections.

7. Metropolitan areas are not included.

Performance guarantee covers:

1. Manufacturer agrees to check enamel resistance at time of line completion. He guarantees that initial current requirements needed to obtain a minimum pipe-to-soil potential of 0.85 v as measured with a saturated copper sulfate electrode shall not exceed 1 amp, per mile of pipe, if application has been properly made and under good pipeline practices.

2. When backfill has consolidated for one year, current requirements per mile of pipe will not exceed by more than 10 per cent the initial current requirements to give a minimum pipe-to-soil potential of 0.85 v.

3. Manufacturer agrees to check line periodically until expiration of guarantee period.

4. With customer's consent manufacturer further guarantees to make periodic inspections of the line, at which time authorized personnel of the owners will be welcome.

5. If corrosion has occurred as a direct result of product failure, manufacturer will at its option supply such additional cathodic protection as is required. Or, will replace such defective enamel. In the opinion of the manufacturer, it would be highly unlikely that significant metal damage could occur between inspections and checks. Should this happen, however, Gulf States Asphalt will, at its option, either replace defective metal or meet cost of increased current requirement.

Lone Star to help finance gas wells

A large-scale gas production program is being launched by Lone Star Gas Co. and Coastal States Gas Producing Co. Site is 30,000 acres of Coastal's 120,000 proven acres in north Texas. A 20-year contract has been signed by Lone Star and Coastal.

The acreage—in Brown, Eastland, Comanche, and Erath counties—is estimated to have reserves of 267 trillion cu ft of proven gas and some 4 million bbl of proven condensate.

Lone Star will buy the gas and build a gathering system interconnecting two fields 37 miles apart. Also, Lone Star will advance $15,000 per well to Coastal toward the cost of 50 completed wells.

Coastal will build facilities to extract liquid hydrocarbons from the gas being processed. These revenues will accrue exclusively to Coastal.

Deliveries are expected to begin in May or June 1960.

CASE HISTORIES SHOW...

pipelines with internal coating have increased throughput . . . higher income . . . less maintenance . . . longer life . . . better return on capital investment!

CONTAMINATION ELIMINATED

A 3" sour crude line was switched to products service and considerable trouble was caused by residual deposits contaminating the butane and propane products. The line was cleaned and plastic coated internally by Pipecote. It has performed with 100% efficiency to date with **no contamination.**

THROUGHPUT INCREASED

A 10-year old 24" gas line was internally coated, in place, with epoxy resin by Pipecote. Flow tests on an 11.9 mile section of the coated line showed an increase of between 5% and 10% in throughput at flow rates between 150 MCFD and 450 MCFD.

LIFE EXTENDED

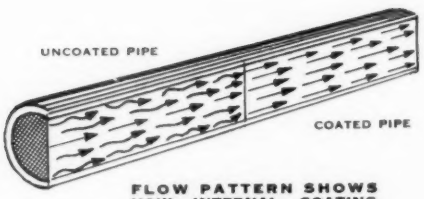
This 25-mile long gathering system of 4" to 12" pipe was badly pitted and corroded with many pinhole leaks. Pipecote cleaned and internally coated the entire system in place. The operator recently reported that the line, which carries sour gas, has given seven years of uninterrupted service. New, uncoated pipe in the same area normally begins to fail after three years' service.

The Pipecote method of internally coating pipe lines is a proven, economical way to restore old lines to new usefulness and to extend the life of new lines. The Pipecote method offers five major benefits . . .

1. **Substantial increase in throughput due to reduced friction**
2. **Power costs decreased due to increased efficiency**
3. **Longer Life — line is protected from internal corrosion**
4. **Decreased contamination of products**
5. **Substantial reduction in maintenance costs**

If you are installing a new pipe line or are faced with the prospect of frequent repairs or replacement of inefficient lines . . . investigate the advantages of the Pipecote method of internal coating. A Pipecote representative will be glad to consult with you on your problems.

IT WILL PAY YOU TO INVESTIGATE THE OPERATING ADVANTAGES OF COATED PIPELINES VERSUS PIPELINES THAT ARE UNCOATED.



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WRITE FOR A FREE COPY OF OUR NEW MANUAL ON THE THEORIES, PROCEDURES AND APPLICATION TECHNIQUES EMPLOYED IN INTERNAL COATING. MANUAL INCLUDES 10 CASE STUDIES THAT SHOW HOW OPERATORS HAVE EMPLOYED INTERNAL COATING TO PROFITABLE ADVANTAGE.

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Oscar S. Wyatt Jr. (fourth from right) president of Coastal States Gas Producing Co., turns gas from his company's South Texas Natural Gas Gathering Co.'s 20-in. line into Texas-Illinois Gas Pipeline Co.'s system north of Falfurrias, Texas. The new 120-mile line takes gas from Brooks, Hidalgo, and Starr counties. Looking on are (from left): E. A. Allen, assistant superintendent of production; F. Pat Burns, vice president; and C. R. Worst, superintendent of production—all of Texas-Illinois; Jack Ware, vice president of Coastal; Wyatt; Harold Vance, vice president of the Bank of the Southwest; Dr. John King, vice president, and Jesse Hendricks, manager of operations—both of Coastal States.

Gas is pumped into Leidy storage field

Gas is being pumped into the recently completed Leidy underground storage pool in north central Pennsylvania. Three 2000-hp compressor engines pumped initially. Two 1000-hp units will be in operation shortly. Pumping rate is more than 120 MMcf per day.

Plans call for a storage inventory of 27 billion cu ft by winter. Of this volume, 15 billion cu ft will be cushion gas. The remaining 12 billion cu ft will go to Transcontinental Gas Pipe Line Corp.'s eastern markets.

Although Texas Eastern Transmission Corp. and New York State Natural Gas Corp. are in the project with Transco, only Transco is using the facilities at this time. The others will develop their share when market needs call for it.

Leidy and Tamarack gas fields, about 15,000 acres in size, will be among the nation's largest when ultimately completed. Then it will have a capacity of more than 105 billion cu ft of gas for customers in New York, Pennsylvania and New Jersey.

NY Natural line under way

New York State Natural Gas Corp. is slated to complete a 37.3-mile 20-in. line this month. The line runs from south of Luthersburg, Pa., to New York Natural Valley Gate connection near Rural Valley, Pa.

The line will loop New York Natural's system from Armstrong to Potter counties.

Texas Illinois plans bigger peak-day deliveries

Texas Illinois Natural Gas Pipeline Co. wants to increase peak-day gas deliveries into a seven-state area by 85 MMcf.

The major portion of the $43.5 million plan will go to paralleling the company's 1400-mile line from Texas. Some 371 miles of 30-in. line will be installed. Also to be built are 55 miles of laterals and one 6700-hp compressor station in Victoria county, Texas.

Customer companies, other than those serving the Chicago area, will receive most of the gas, if the project gets the go-ahead from FPC.

Offshore platform sending gas to Pacific Lighting

Pacific Lighting Gas Supply Co. is taking first deliveries of gas from an offshore drilling platform in California waters.

Built by Standard Oil Co. and Humble Oil & Refining Co., the platform stands in 90 ft of water off the cost of Santa Barbara.

Initial deliveries are expected to be 1 MMcfd. An increase to 2 MMcfd is planned within six months.

Gas is coming from the platform via a common flow line—in combination with oil and by-products—laid on the ocean floor.

The 1000-lb pressure will be the highest ever taken by PLGS from a California producer.

While the Standard-Humble gas is the first PLGS has taken from an offshore platform, it has been getting offshore California gas for the past four years. These deliveries have been made from man-made islands.

FPC hears plan to import Canadian gas

Hearings get under way this month on plans to import Canadian gas into New York. FPC will hear applications by St. Lawrence Gas Co., Ogdensburg, N. Y., and New York State Natural Gas Corp., Pittsburgh. Niagara-Mohawk Power Corp., Syracuse, is involved in the plan but is exempt from FPC regulation.

St. Lawrence wants to import gas into the U. S. for use in towns and industries in the Massena-Ogdensburg area. New York Natural wants to sell U. S.-produced gas to Niagara Mohawk to service substantially the same area as St. Lawrence.

St. Lawrence would build a 1000-ft 12-in. connection with Niagara Gas Transmission Ltd. at the international boundary near Cornwall Island in the center of the St. Lawrence River. (Niagara is a subsidiary of Trans-Canada Pipe Lines Ltd.) In the third year of operation, Niagara would deliver 8.2 MMcfd on a peak-day basis to St. Lawrence. Estimated cost of St. Lawrence's project in the first year is $3.4 million. At the end of the sixth year, it would be $6.7 million.

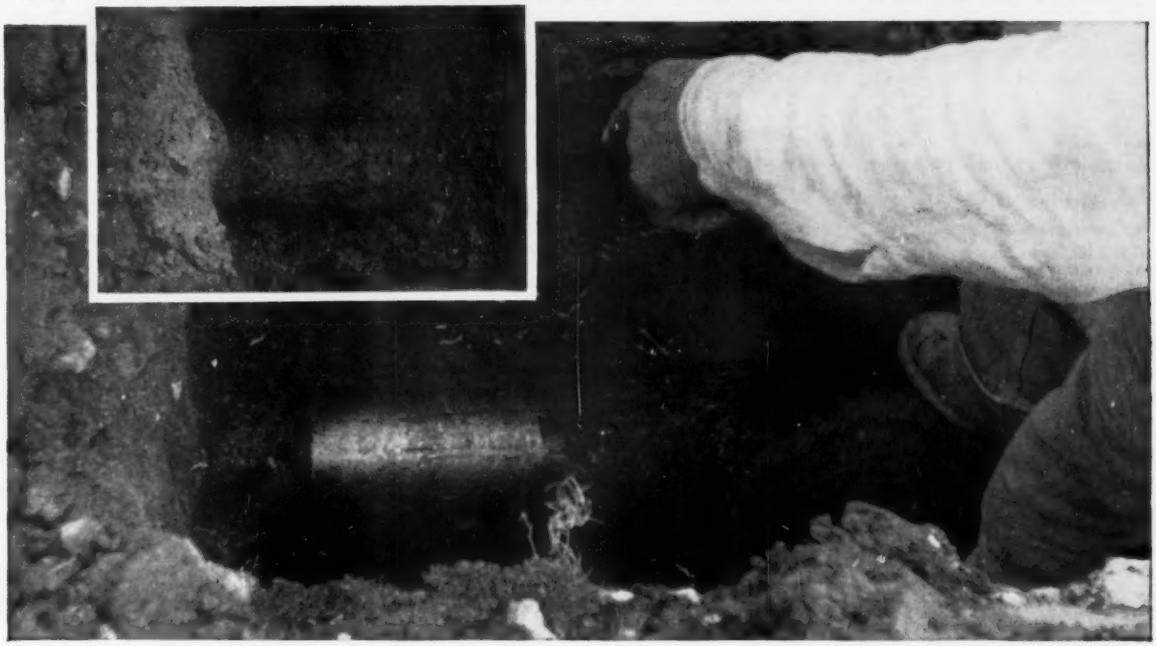
New York Natural seeks to sell additional gas to Niagara Mohawk for resale in St. Lawrence, Lewis, and Franklin counties, N. Y. No new facilities are proposed. Niagara Mohawk would expand its system by spending some $13.1 million on new facilities in the first year and increasing the amount to $17.6 in the seventh year.

Replacement planned

United Fuel Gas Co. wants to build 4.8 miles of line and add 8400 hp in compression to its system. Construction covered in Docket G-18550 would be near Huntington, W. Va.

The $3.5 million project is part of the company's plan to replace portions of a low pressure transmission system between Kenova compressor station and the Lewis and Cobb stations.

17-YEAR PROTECTION RECORD!



Year After Year...More Evidence Proving That TAPECOAT® Adds Years of Service Life to Gas Lines Underground or Under Water

Right across the country, TAPECOAT installations prove that you get more for your money when you measure pipe protection with a calendar.

Since this cost-cutting coal tar coating in tape form was first introduced in 1941, it has demonstrated its ability to withstand severe conditions underground or under water. TAPECOATED lines dug up after 17 years of service show no signs of deterioration on the pipe.

Typical is the experience of a utility in a coastal area. For a thorough trial, this company applied TAPECOAT in areas where severe corrosive conditions were known to exist. The lines were dug up this year and, after years of service under severe conditions such as brackish waters and corrosive soil, the pipe showed no signs of corrosion, proving the quality of TAPECOAT protection.

In terms of preventive maintenance and replacement costs, performances like this emphasize the most important consideration in buying protection. Remember, TAPECOAT is a hot-applied coal tar coating in tape form—designed for lasting protection on pipe, pipe joints, service connections, mechanical couplings, fittings, insulated lines, tanks, tie rods, and other steel surfaces vulnerable to corrosion.

TAPECOAT comes in rolls of various widths and is available in asphalt. Where primer is desired, specify TC Primecoat, the compatible coal tar primer.

A TAPECOAT sales and service engineer is always available to help you on any corrosion problem. Write for complete details today!

The TAPECOAT *Company*

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FPC okays OFG building

Ohio Fuel Gas Co.'s $1.7 million plan covered in Docket G-18359 has FPC approval.

Involved is construction of 28.4 miles of 6- to 12-in. line and 9.2 miles of 24-in. in several Ohio counties.

Gas revenues totaled $3.5 trillion in '58

Gas operating revenues of interstate natural gas companies totaled $3.5 trillion in 1958. Their gas sales amounted to 10.17 trillion cu ft, the FPC reports. Ninety-one companies were in operation during 1958. Their combined assets were $10.7 trillion.

Sales of natural gas and revenues reported by pipelines companies for 1958 amounted to 8.51 trillion cu ft and $2.5 trillion. These are increases of 4.5 per cent in sales and 11.3 per cent in revenues over 1957.

Air base gets gas supply

Montana-Dakota Utilities Co. got a temporary okay of its plan to supply gas to the U. S. Air Force base near Glasgow, Mont. Docket G-18604 also covers adding capacity to the company's system in order to meet maximum day demands.

The $1 million project includes 15.5 miles of 6⅝-in. line in Valley county, Mont., and a meter and regulator station to serve the air force base. Montana-Dakota also will install 1540 additional hp at plants in Valley and Fallon counties, Mont.

FPC adopts examiner's Deep South ruling

Deep South Oil Co. can sell gas to Texas Gas Corp. under a modified decision (Dockets G-14705 and 14764).

The Jan. 9 decision of Examiner Glen Law dismissed as satisfied and moot a show cause order directed to Deep South. In March 1958 the FPC ordered Deep South to show cause why it should not comply with the Natural Gas Act and continue gas deliveries to Texas Gas. Law said Deep South's certificate filing and rate schedule showed compliance with the order.

Texas Gas buys the Deep South gas for resale to Texas Eastern Transmission Corp. Both Texas Gas and TET filed exceptions to the examiner's January decision.

The Deep South-Texas Gas contract is the subject of litigation between Deep South, Texas Gas, and Texas Eastern in three court cases. Texas Gas and Texas Eastern objected to Law's finding that the FPC need not involve itself with issues pending in court in order to okay the sales. FPC said the examiner was right in finding that it need not pass upon the issues now before the courts in order to issue a certificate to Deep South. And, "we do not pass upon those issues here, nor do we waive any jurisdiction that lawfully attaches under the . . . Act."

PNW gets final okay on Colorado gas

New pipeline facilities to pick up gas from producers in Rio Blanco County, Colo., have been authorized for Pacific Northwest Pipeline Corp. (Docket G-13456 et al).

An average of 1 MMcfd will be taken during the first five years at a rate of 15 or 16 cents per Mcf. Increases will be at 1-cent escalations each five years thereafter.

FPC held that evidence wasn't shown that a rate condition is required. It indicated that imposition of such a condition would interfere with exploration for gas in the area. FPC staff and Western Slope Gas Co., an intervenor, asked for a lower initial rate. Western Slope wanted the gas sold at 12 cents. Adjustments for increased delivery pressure and heat content would result in a 14.92 cent rate. The staff recommended a 12-cent price.

Plan Canadian system

St. Maurice Gas Inc., Montreal, is joining with Consumers' Gas Co., Toronto, in building pipeline facilities to serve Quebec City and the province's eastern townships.

The $30 million line has a market of about 800,000 people. It covers the last big industrial area not already served by Alberta gas. Operator of the line would be Cartier Gas Co., jointly owned by St. Maurice and Consumers.

SoCal retires station after 45 years of service

Southern California Gas Co. is retiring its 45-year old gas compressor station near Taft, Calif. For almost half a century, Station 40 has been helping gas over the Tehachapi mountains.

A new station has been built adjacent to the original. It houses four modern gas engine compressors.

The old station was one of the gas company's most famous historical landmarks. Its seven twin-tandem Cooper compressors pumped the first natural gas from the San Joaquin gas and oil fields over the mountains to the metropolitan area of Los Angeles.

More contracts let

Contracts for six major river crossings have been let by Midwestern Gas Transmission Co.

Contracts went to: Sharman, Allen, Gay & Taylor for the Green River in Kentucky; Pentzien Inc., for the Ohio River on the Kentucky-Indiana state line; to Popich Marine Construction Inc. for the White and Wabash Rivers in Indiana; to Missouri Valley Dredging Co. for Illinois' Kankakee; and to Collins Construction for the Des Plaines in Illinois.

New York Natural-Iroquois plan approved

New York State Natural Gas Corp.'s plan to increase gas deliveries to Iroquois Gas Corp. has been approved.

Under Dockets G-14956 et al, New York Natural will spend $1.6 million on 29.5 miles of 20-in. line and two measuring and regulating stations.

New York also was allowed to stop selling up to 5.5 MMcf annually to Penn-York Natural Gas Corp. It also can abandon some 11.7 miles of 10-in. line and a metering station needed to make the sale.

Penn-York and Iroquois are affiliates of the National Fuel Gas Corp. They said that National Fuel plans to make it practical for New York Natural to sell the gas to Iroquois instead of Penn-York.

Iroquois was told to build about 7.5 miles of 8-in. line to move the New York gas.

Cities Service okayed

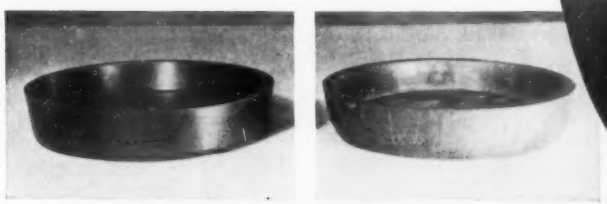
Cities Service Gas Co. has an FPC certificate for an $8.2 million building program in Kansas, Missouri and Oklahoma. Docket G-17941 also covers acquisition, development and operation of a new storage area in Elk county, Kan.

Included in the project: 22.5 miles of 4- to 16-in. line and 43.4 miles of 12- to 30-in. Cities Service also will add 2140 hp at two existing stations.

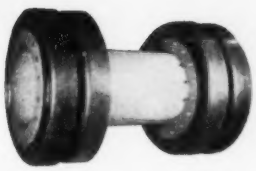
NEW WmSON TAPRSEAL®

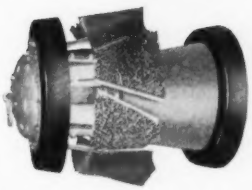
SCRAPER CUP

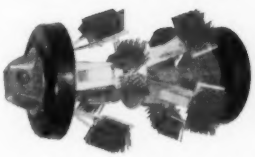
OFFERS PROVEN RESISTANCE TO WEAR, TEAR AND SWELLING!



Actual photographs of TAPRSEAL cup before and after simulated pipeline test in ethyl gasoline for five days (500 miles)







TAPRSEAL Scraper cups for all types of pipeline scrapers from 2" to 36".

Williamson testing equipment, the only repetitive COMPARATIVE cup tester in existence, has proven the TAPRSEAL to be WEAR RESISTANT . . . TEAR RESISTANT and SWELL RESISTANT. As the photographs show, there were no tears or breaks and only minimum wear after this torturous test.

Specify WmSon TAPRSEAL Scraper Cups . . . developed after years of research . . . proven after months of testing.

PIONEERS OF PIPELINE EQUIPMENT

T. D. Williamson, Inc.
P. O. BOX 40 TULSA 2, OKLAHOMA

REPRESENTATIVES AROUND THE WORLD

Louisiana Tech announces instrumentation session

Louisiana Polytechnic Institute's school of engineering has scheduled the 8th annual instrumentation conference for Nov. 5-6. It will be held on the campus at Ruston, La.

Among papers to be presented "Fundamentals of Electric and Electronic Instrumentation," by E. E. Williams, Louisana Tech; "Electronic Computers for Automatic Plant Operation," by Donald L. Aswell, Louisiana Power & Light Co., Sterlington, La.; "Air Drying of Paper," by an engineer from Rice Barton Corp., Worcester, Mass.; "Process Stream Analyzers of the Chromatographic Type," by H. O. Anderson of Olin Mathieson, Niagara Falls, N. Y.; and "Discussion of AGA Report No. 3" by Earl N. Armstrong, Transcontinental Gas Pipe Line Corp.

In addition, there will be exhibits of new instrumentation and process control equipment.

Parallel line wanted

United Gas Pipe Line Co., Shreveport, wants to put in 8.7 miles of 30-in. line (Docket G-18649). The line will parallel a section of its system soon to be submerged by a flood control project on the Angelina river in Texas.

United said the $2 million line will be built as a safety measure in assuring continuous operation of the line.

Intrastate line planned for Louisiana

Intrastate service in Louisiana is planned by Monterey Pipeline Co., new subsidiary of Monterey Oil Co.

Gas from reserves at Darrow Dome, Lake Boeuf and other sources will serve the Mississippi River industrial complex from New Orleans to Baton Rouge.

Construction is under way on a 37.5-mile, $2.5 million line. Completion is slated for September. By lease agreement, the line will connect with the 85-mile intrastate system of Sugar Bowl Pipe-Line Co. Monterey has the right to buy additional gas supplies as needed.

Monterey is furnishing through the lease facility more than 5 MMcfd to Wyandotte Chemicals Corp. On Jan. 1, 1960, deliveries averaging 25 MMcfd will begin for Kaiser Aluminum Corp.

Southeast terminus of the new system will be at Lake Boeuf. Eight-inch lines converging from Lake Boeuf and Thibodaux at Marse School into a 14-in. line will service Kaiser at Gramercy. Two 4-in. lines will cross the Mississippi.

Undisputed Champion!

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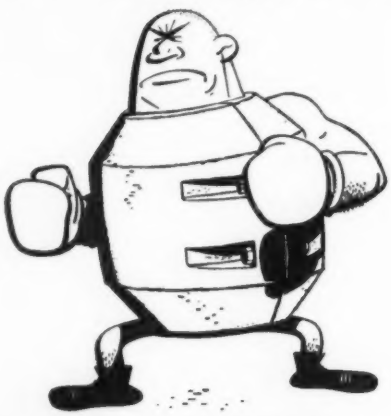
HEAVYWEIGHT

RIVERWEIGHTS

PUT YOUR

PIPELINE



. . . DOWN FOR KEEPS

Allan Edwards, Inc., is the nation's oldest manufacturer of concrete riverweights. Weights are carefully designed and constructed to meet individual requirements. Weights can be constructed at your jobsite if tonnage warrants. Other fine Allan Edwards pipeline specialty products include . . .

WELDING SLEEVES • HALF SOLES • MARKER POSTS

Allan Edwards, Inc.

2445 S. Jackson—P. O. Box 7218, Tulsa, Oklahoma

SRS • Pipeline Notes

Chrysler's marine and industrial engine division is adding a complete line of diesel engines to its products. Chrysler has a contract with Klockner-Humboldt-Deutz of Germany, and its American subsidiary (United States Diesel Energy Corp.), to represent their high-speed engines in the U. S.

Crutcher-Rolfs-Cummings Inc is distributing the complete line of Johns-Manville fiber glass pipe wrap products. C-R-C's general headquarters are in Houston. It has a branch office in Farmington, N. M., and a Canadian operation (Canadian Equipment Sales & Service Co. Ltd.) in Edmonton, Alberta.

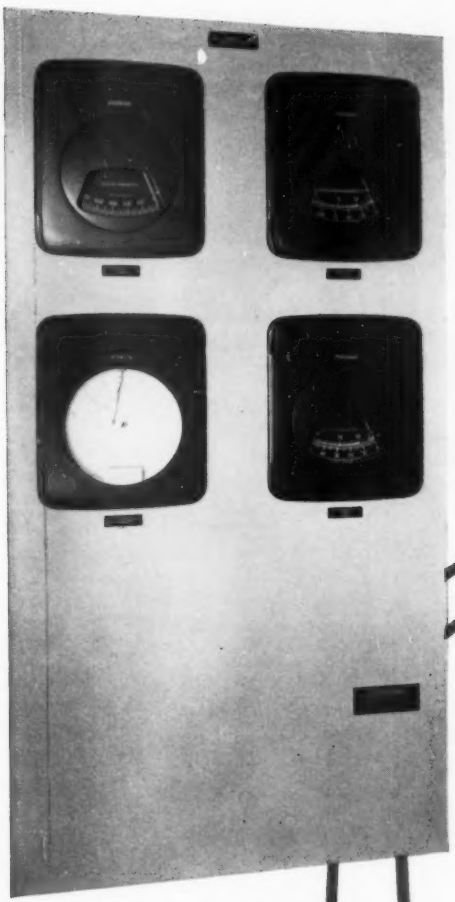
Allis-Chalmers' acquisition of the Tractomotive Corp. has been completed. It becomes the 21st plant in the Allis-Chalmers family and will be operated as the Deerfield (Ill.) works.

E. W. Robinson Supply Co., Houston, has been appointed distributor of Johns-Manville asbestos pipeline felts and the complete line of fiber glass pipeline products. Robinson has branch operations in Denver, Dallas, Salt Lake City, and Ponca City and Tulsa, Okla.

Walworth Co., New York, has organized a French corporation to manufacture and sell valves for pipelines in France and the French colonial possessions. Grove-France, S.A., will be under the direct management of Marvin H. Grove, president of Grove Valve & Regulator Co., Walworth subsidiary. The plant will be in Soissons, France.

A corrosive engineering division has been formed by Maloney-Crawford Tank & Manufacturing Co., Tulsa. The division will be headed by W. W. Wibel of Chicago.

"packaged" automatic gas flow computer systems



Typical Foxboro Gas Flow Computer Differential and static pressure instruments (right side of panel) convert measurements to electrical inputs for the Dynalog Computer-Telemeter (lower left). Instrument at (upper left) telemeters down-stream gas pressure.

piped, wired, calibrated ready for installation

A continuous record of gas flow — into or out of your pipelines — that's the information a dispatcher gets automatically with the Foxboro Gas Flow Computer.

Foxboro systems do their computing at the meter station, automatically compensating for gas temperature and pressure, and transmit total flow values. Transmission errors common to systems that compute at the receiving end are eliminated. Transmission line space is saved as well.

Foxboro Gas Flow Computers are furnished as a complete packaged unit — calibrated and tested as a system before shipment. Installation is as simple as setting the panel unit in place — making connections. Computers are available for both single and multiple meter runs.

Ask your local sales engineer about the Foxboro Gas Flow Computer. He can tell you about many installations in successful operation. **The Foxboro Company, 349 Norfolk Street, Foxboro, Mass.**

FOXBORO
REG. U.S. PAT. OFF.
Instrumentation

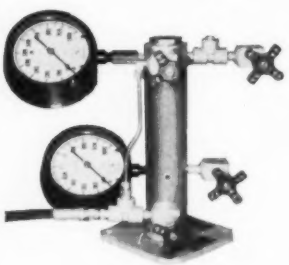
GARRETT PRESSURE RELIEF VALVES

REDUCE COSTLY SHUT-DOWN TIME!

HERE'S HOW:

Without removing the valve body from the line, the set pressure and re-set pressure of a Garrett Relief Valve may be checked in a few minutes time. Using the small, light weight Garrett Test Fixture, pressure from bottled nitrogen or other source, and regular hand tools, pressures may be checked or changed by field personnel, without special training.

This is another feature of Garrett Relief Valves which adds to the safety and economy of your operations.



The Garrett Test Fixture is simple to use, light and easy to carry, and completely accurate in operation.

FOR COMPLETE INFORMATION, WRITE FOR CATALOG NO. RV-103-A

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P. O. BOX 2427 • LONGVIEW, TEXAS

GAS Pipeline People

GORDEN C. BOWEN, secretary-treasurer, and JOHN B. THORN, director of sales and rates, have been elected vice presidents of Algonquin Gas Transmission Co., Boston. Bowen joined Algonquin in 1952 as comptroller. Before joining Algonquin in 1958 as director of sales and rates, Thorn served as secretary and assistant to the president of Portsmouth Gas Co., Commonwealth Natural Gas Co. subsidiary.

Gordon Bowen
Algonquin

John B. Thorn
Algonquin

HERBERT H. HODGEMAN has joined Daniel Orifice Fitting Co., Houston, as valve design engineer.

PHILLIP L. ARNOLD has been named service engineer in the Detroit district sales office of Youngstown (Ohio) Sheet & Tube Co.

Clark Bros. Co., Olean, N. Y., appointed Z. B. DEER JR. as sales engineer in the Texas-Oklahoma Panhandle area. He will headquarter in Pampa, Texas.

Nordberg Manufacturing Co., Milwaukee, has named JOHN A. SNARENBERGER as sales engineer assigned to the Kansas City territory. He will headquarter in Wichita.

CARL PEHLKE is assistant to the manager of the microwave department for Motorola's Communications & Industrial Electronics Division, Chicago.

DONALD L. HORTON has been named production engineer at Wichita, Kan. for Northern Natural Gas Producing Co.

Continued on page 166

Careful supervision of a wide geographical area over 100 miles in length is the watchword at Long Island Lighting Co.

The Long Island Lighting Co., a combination company, strives to maintain a 100% Load Factor, on purchased gas. Naturally, to avoid contract penalties the load variation requires careful supervision of the gas distribution system.

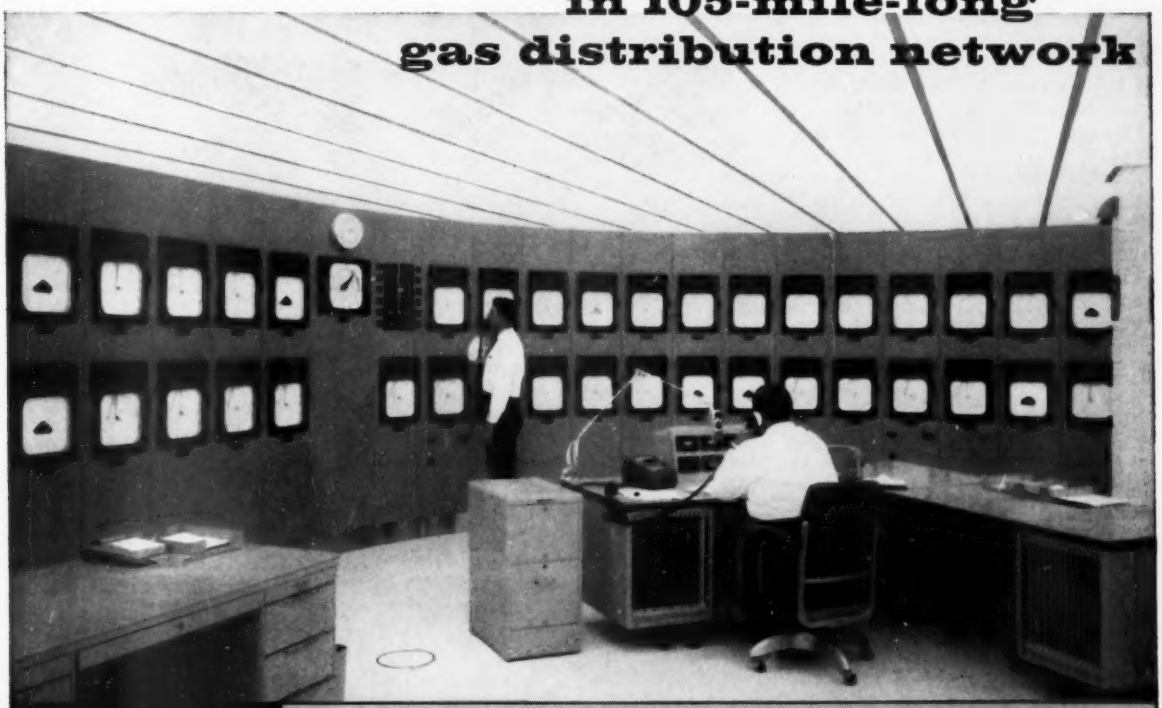
Only one dispatcher per shift controls the distribution system—24 hours a day, 7 days a week. Bristol telemeters put continuous status information at the dispatcher's finger tips: individual flows, pressure of gas at gate stations, amount of gas purchased at gate stations as well as status of the distribution system with pressures telemetered from important points on the Island.

Long Island Lighting anticipates that their gas load will more than double by 1962 and their Bristol instrumentation is flexible enough to take this increased demand in its stride.

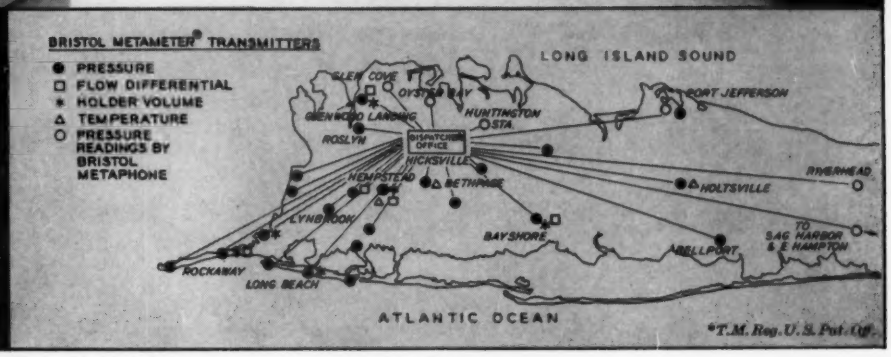
Why not find out what Bristol telemetering can do for you? Better pressure regulation during unexpected demand periods, avoidance of contract penalties, security against interruption to service from abnormal conditions are just a few of the benefits you can expect. Distances can be anything from "in-plant" to hundreds of miles. Write: The Bristol Company, 119 Bristol Road, Waterbury 20, Conn.

B-10

BRISTOL TELEMETERING helps maintain load in 105-mile-long gas distribution network



Bristol Metameter* Receivers on gas dispatcher's panel at Long Island Lighting Company's Hicksville, N. Y. Operations Center. These recording instruments make possible precision operation of a distribution network over 100 miles in length (see map).



BRISTOL *TRAIL-BLAZERS IN PROCESS AUTOMATION*
AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

Earl Clark
Northern

R. T. Klemme
Northern

R. L. Moore
Cooper

E. D. VanFossen
Cooper

Roy Johnson
Cooper

BURTON F. WIAND has been elected vice president in charge of the public and industrial relations division of Cities Service Gas Co., Oklahoma City. He has been with the company since 1952, as manager of the public and industrial relations division. He was elected to the board of directors in 1956.

M. L. CLOUGH has joined the management consulting staff of Ebasco Services Inc., New York.

ALLYN W. FALLS has joined Ebasco Services Inc. in the San Francisco office.

B. D. COYLE has been named sales representative in the Tulsa headquarters of Midwestern Pipe Line Products Co. Formerly, Coyle was with F. H. Maloney Co.

FRED B. CRANDALL has been appointed general sales manager for T. D. Williamson Inc., Tulsa. Crandall joined the company in 1952 as research and development engineer. In 1956 he became factory sales engineer for the upper Great Lakes area. He returned to Tulsa in January of this year as acting general sales manager.

The newly created post of manager, special products, for W-K-M, division of ACF Industries Inc., is being filled by C. ROSS SPENCER. He was formerly with the Oil Center Tool Co. and National Supply Co.

Several appointments have been announced by Cooper-Bessemer Corp., Mt. Vernon, Ohio. ROY W. P. JOHNSON becomes New York district manager. He succeeds CHARLES M. REAGLE, retiring after 35 years with Cooper-Bessemer. Johnson formerly was assistant manager of the district. At the time of his retirement, Reagle also was a vice president of the company. HAROLD G. BLASSEY has joined Cooper-Bessemer's New York domestic branch office, working with Branch Manager C. J. HAVEKOTTE. Cooper-Bessemer of Canada Ltd. has promoted E. D. VANFOSSEN and R. L. MOORE to division managerial post. VanFossen is western district manager, with offices in Calgary. Moore, as eastern district manager, operates from Toronto.

ARVID H. EDWARDS has been appointed advertising manager of Black, Sivalls & Bryson Inc., Kansas City, Mo. Edwards has been a member of BS&B's advertising staff since 1948.

ROBERT O. WYNN is vice president of engineering and research and HENRY C. TOOLEY is vice president of manufacturing of the W-K-M Division of ACF Industries Inc. Wynn has been vice president of engineering since 1956. Before that he was head of W-K-M's engineering department. Tooley joined the company in May as manager of the Missouri City, Texas plant.

EARLE A. CLARK and RANDALL T. KLEMME have been elected vice presidents of Northern Natural Gas Co., Omaha. Clark directs Northern's public relations, advertising and promotion activities. He was director of public relations before his promotion and has nine years service with Northern. Klemme will direct the marketing, area development, research and customer relations activities for Northern. He joined the company in 1958. Northern also named H. M. SAMPSON assistant vice president. Before his promotion, Sampson was director of customer relations.

K. J. WALKER is manager of South American sales for Garrett Oil Tools, division of U. S. Industries Inc., Longview, Texas. He will establish an office in Caracas, Venezuela. Walker is succeeded as manager of relief valve sales by N. V. FOWLER. Fowler has served as relief valve sales engineer since 1957.

C. Ross Spencer
W-K-M

B. F. Wiand
Cities Service

B. D. Coyle
Midwestern

Fred Crandall
Williamson

K. J. Walker
Garrett

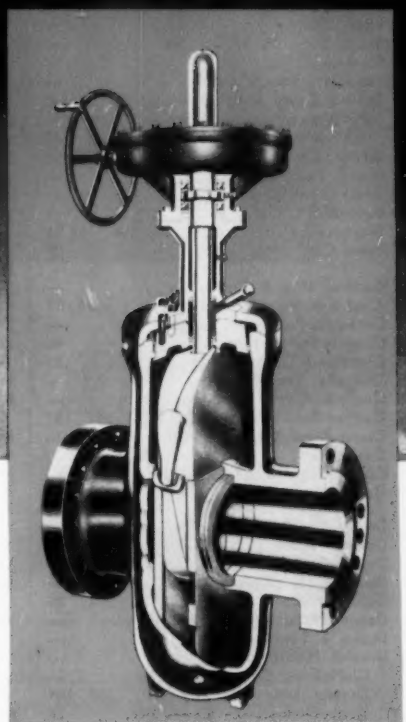
"Best Valve Insurance You Can Buy"

W-K-M® ASA Gate Valves

More than 300 rigid inspections certify the precision quality and long life that's built into every W-K-M pipeline valve. That's one reason W-K-M valves are recognized the world over for their superior construction and outstanding performance.

No other valves give you the same long-lasting service and economy. No other valves require so little maintenance.

Next time — and every time — specify W-K-M! Available at leading supply stores everywhere (from 2″ through 12″). Sizes through 34″ available on special order.



W-K-M Leverlock® Gate Valves feature through-conduit gate construction, parallel expanding gates, exclusive gate centralizers, controlled force seating, pressure seal bonnets, super-finished stems, seating surfaces sealed from the lading flow — and can be overhauled on-the-line.

Pressure Ratings: ASA 300 through ASA 1500 pounds.

Product of W-K-M's *Creative Engineering*

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W-K-M Division of
ACF Industries, Incorporated
P. O. Box 2117, Houston, Texas

W-K-M
SERVING INDUSTRY 40 YEARS

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— INDEX TO ADVERTISERS —

This advertisers' index is published as a convenience and not as part of the advertising contract. Every care will be taken to index correctly. No allowance will be made for errors or failure to insert.

ACF Industries Inc., W-K-M Div. 167
Adams Pipe Repair Products ..... —
Air-Maze Corp 112
Air Preheater Corp. 155
Allied Chemical, Plastics & Coal Chemicals Div. ..... —
Allis-Chalmers Mfg. Co. 7
American Cast Iron Pipe Co. 56
American Meter Co. Front Cover, 58, 106
American Meter Co., Reliance Regulator Div. ..... Second Cover
American Recording Chart Co. 111
American-Standard 113
Aqua Survey & Instrument Co. ..... —
Arkla Air Conditioning Corp. 114
Arrow Manufacturing Co. 89
Auburn Machine Works ..... —

Barber-Greene Co. 77
Baso Inc. ..... —
Bethlehem Steel Co. ..... —
Bilco Co. ..... —
Black, Sivalls & Bryson, Inc. Third Cover
Blaw-Knox Co. 154
Bonded Products Inc. ..... —
Bonney Forge & Tool Works ..... —
Borg-Warner Corp., Marbon Chemical Div. 49
Bristol Co. 165
Brooks Products Inc. ..... —
Brown & Root Inc. ..... —
Bucyrus-Erie Co. 34
Burroughs Corp., ElectroData Div. 22-23
Byers Co., A. M. 106

Capitol Mfg. & Supply Co. ..... —
Cast Iron Pipe Research Assn. 26, 27
Cathodic Protection Service ..... —
Chaplin-Fulton Mfg. Co. 45
Cleveland Trencher Co. 103
Connelly, Inc. ..... —
Controls Co. of America ..... —
Cooper-Bessemer Corp. 152, 153
Coast Paint & Lacquer Co. ..... —
Cosa Corp. ..... —
Crose Mfg. Co., M. J. ..... —
Cutler-Hammer Inc. ..... —

Daniel Orifice Fitting Co. ..... —
Darling Valve & Manufacturing Co. —
Davey Compressor Co. ..... —
Day Co., S. D. ..... —
Dollinger Corp. 24
Dover Corp., Peerless Mfg. Div. ..... —
Drake & Townsend Inc. ..... —
Dresser Industries, Inc. ..... —
Clark Bros. Co. ..... —
Dresser Manufacturing Div. ... 100, 101
Roots-Connersville Blower Div. 16

Eastman Chemical Products ..... —
Ebasco Services, Inc. ..... —
Edwards Inc., Allan 162
ElectroData Div., Burroughs Corp. 22, 23
Electro Rust-Proofing Corp. 108
El Paso Natural Gas Co. ..... —
Emhart Manufacturing Co., Maxim Div. ..... —

Fish Engineering Corp. ..... —
Fisher Governor Co. 20, 21
Fisher Research Laboratory, Inc. 110
Flexonics Corp. ..... —
Ford Motor Co. 28
Foxboro Co. 163

Garrett Oil Tools, Inc. 164
Gas Equipment Manufacturers Committee ..... —
General Controls 13
General Electric Co. 5
Glidden Co. ..... —
Good-All Electric Mfg. Co. 104
Goodrich Chemical Co., B. F. 30
GPE Controls Inc. ..... —
Grabler Manufacturing Co 1
Grayson Controls Div., Robertshaw-Fulton Controls Co. 37
Grove Valve & Regulator Co. 32

Handley-Brown Co. 47
Hardwick Stove Co. ..... —
Hays Manufacturing Co. 93
Heath Survey Consultants Inc. 112
Hill, Hubbell Co. 33
Holan Corp. 54
Homestead Valve & Manufacturing Co. ..... —
Houston Contracting Co. ..... —

Ingersoll Rand Co. ..... —
International Business Machines Corp. —
International Harvester Co. 57

Jaeger Machine Co. ..... —
Johns-Manville Corp. 143
Jones & Laughlin Steel Corp. ..... —

Ka-Mo Tools Dept., Kwik-Mix Co. —
Kimray Inc. ..... —
Koenig Iron Works, Inc. ..... —
Koppers Co., Inc., Metal Products Div. 107
Kraloy Plastic Pipe Co., Inc. ..... —
Kwik-Mix Co., Ka-Mo Tools Dept. —

Laclede Steel Co. ..... —
Ladish Co. ..... —
Lancaster Meter Parts Co. 88
Ledeen Manufacturing Co. 4
Lone Star Steel Co. 3

Maloney Co., F. H. ..... —
Manufacturers Engineering & Equipment Corp. ..... —
Marbon Chemical Div., Borg-Warner Corp. 49
Mavor-Kelly Co. ..... —
Maxim Div., Emhart Manufacturing Co. ..... —
Maxitrol Co. 31
May Products, Inc. ..... —
McCabe-Powers Body Co. ..... —
McDonald Mfg. Co., A. Y. ..... —
Midwestern Pipe Line Products Co. —
Minneapolis-Honeywell Regulator Co. ..... —
Minnesota Mining & Mfg. Co. 42
Motorola Communications & Electronics, Inc. 48
Mueller Co. 10, 29

National Tank Co. 116
National Tube Div., U. S. Steel Corp. 138, 139
Natural Gas Odorizing Inc. 55
Naugatuck Chemical Div., U. S. Rubber Co. ..... —
Nordstrom Valve Div., Rockwell Manufacturing Co. 50, 51
Norton-McMurray Manufacturing Co. 102

Onan & Sons, Inc., D. W. ..... —
Oronite Chemical Co. 9

Parker Seal Co. 38
Parkhill Truck Co. ..... —
Parsons Co 105
Peerless Manufacturing Co 84
Peerless Mfg. Div., Dover Corp. ..... —
Perrault Equipment Co. ..... —
Pipelife Process Corp. 157
Pipe Line Service Corp. 149
Pittsburgh Coke & Chemical Co. 141
Polyken Products Div., Kendall Co. 18
Pritchard & Co., J. F. ..... —
Production Plating Works Inc. ..... —

Radiator Specialty Co. 112
Reed Manufacturing Co. ..... —
Reliance Regulator Div., American Meter Co. ..... Second Cover
Republic Steel Corp. 150, 151
Reynolds Gas Regulator Co., Inc. 109
Ridge Tool Co. 85
Robertshaw-Fulton Controls Co., Grayson Controls Div. 37
Thermostat Div. 14
Rockwell Manufacturing Co.
Gas Products Div. ..... —
Instrument Div. ..... —
Nordstrom Valve Div. 50, 51
Roots-Connersville Blower Div. Dresser Industries, Inc. 16
Royal McBee Corp. 52
Royston Laboratories Inc. ..... —

Safety Gas Main Stopper Co. 108
Seamless Rubber Co. ..... —
Security Valve Corp. 109
Shell Chemical Corp. 146, 147
Sherman Products Inc. 25
Skinner Co., M. B. 43
Smith Corp., A. O. ..... —
Smith Manufacturing Co., A. P. 40
Somerville Construction Co. ..... —
Southern Cross Foresters 114
Southern Pipe Div., U. S. Industries —
Speedy Therm Service Co. 111
Sprague Meter Co. ..... Fourth Cover
Stafford Co., R. W. 114
Standard Electric Time Co. ..... —
Standard Magnesium Corp. 92
Standard Pipeprotection, Inc. ..... —
Sun Shipbuilding & Dry Dock Co. ..... —
Superior Meter Co. 39

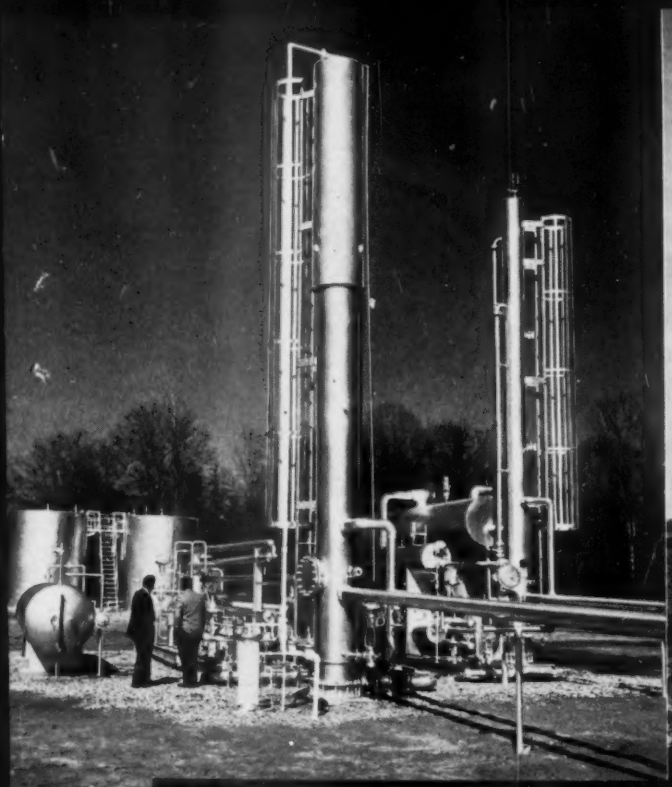
Tapecoat Co. 159
Tennessee Gas Transmission Co. 137
Tex-Tube Inc. ..... —
Thermac Co. 41
Tinker & Rasor ..... —
Transcontinental Gas Pipe Line Corp —

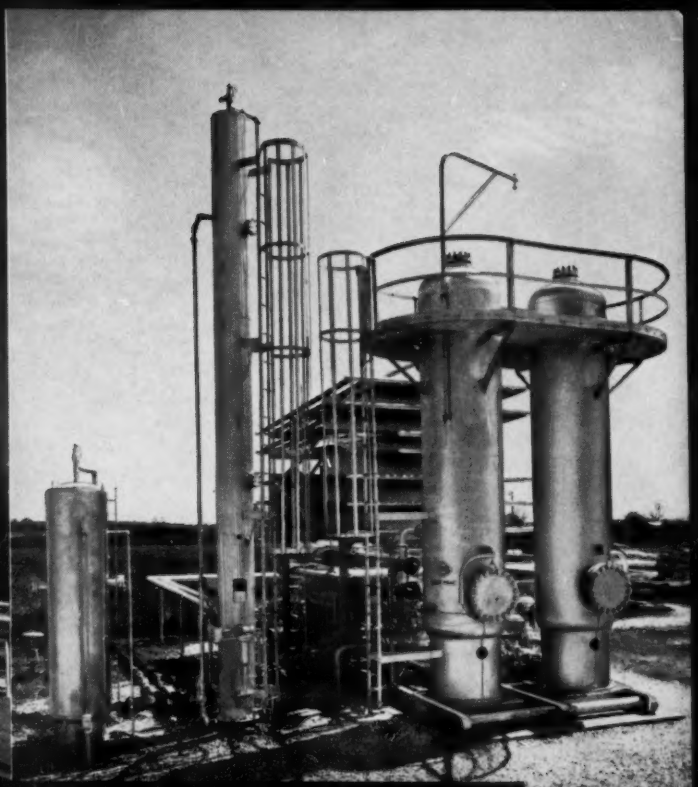
Union Malleable Mfg. Co. 35
Union Switch & Signal Div. Westinghouse Air Brake Co. ... 144, 145
United Engineers & Constructors ..... —
U. S. Industries
Garrett Oil Tools Inc. 164
Southern Pipe Div. ..... —
U. S. Pipe & Foundry Co 53
U. S. Rubber Co., Naugatuck Chemical Div. ..... —
U. S. Steel Corp., National Tube Div. 138, 139
Universal Controls Corp 110

Vermeer Manufacturing Co. 110
Vulcan Rubber Products, Inc. 46

Walworth Co. 36
Warren Petroleum Corp. 114
Westinghouse Air Brake Co., Union Switch & Signal Div. 144, 145
White-Rodgers Co. ..... —
Wilcolator Co. 44
Williams Pressure Service Co. ..... —
Williamson, Inc., T. D. 161
W-K-M Div., ACF Industries Inc. 167
Wood Co., John ..... —
Worthington Corp. ..... —

Youngstown Sheet & Tube Co. ... 134, 135





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